Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York Office, 30 Church Street

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Subscriptions for the fourth issue each month only (published in two sections, the second of which is the Motor Transport Section) payable in advance and postage free; United States, Mexico and Canada, $1.00: foreign countries, $2.00. Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

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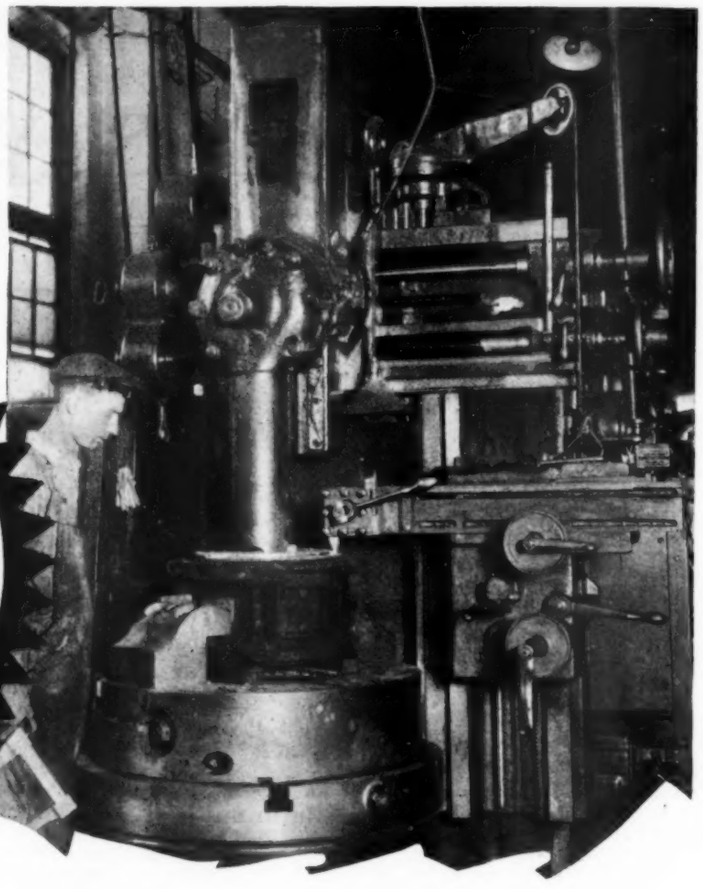
Down on the MISSOURI PACIFIC LINES



They do not have to be shown

OPERATING statistics show that the Missouri Pacific ranks high among the leaders in efficient railway transportation.

The schedules are fast—service excellent—power in A-1 condition and the shops well equipped with modern production units.

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BULLARD

The Bullard Company
Bridgeport Connecticut

VERTICAL TURRET LATHES

Railway Age

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A New Source of Passenger Traffic

UNREMUNERATIVE passenger service continues to be what is probably the most perplexing of the unsolved problems of railway management. Experiments are being made, with varying degrees of success, in the many phases of the situation, but as yet no definite remedy of general applicability has been found. Fare concessions, principally through the device of a multiplication of excursion rates, have been made and service has been enormously improved. While these devices have not succeeded in attracting back to the railways the business they have lost, nevertheless the situation today would doubtless be even more serious if these improvements had not been made.

Maintaining or increasing the volume of day coach traffic is the real nucleus of the problem. The loss of such traffic is attributed with unquestionable logic largely to the private automobile. To attract day coach business many railroads have greatly improved this service, providing more comfortable seats, better sanitary arrangements, and luxuries heretofore known only to Pullman passengers. These facilities have undoubtedly drawn some business, but they have not, generally speaking, succeeded in again filling the coaches with paying passengers.

The Non-Traveling Public

While this loss in coach traffic has been going on, accompanied by an increase in private automobile travel, another development has taken place, i.e., a great increase in long distance highway motor coach traffic. Investigation has disclosed the fact that a considerable proportion of the passengers who make long distance journeys in motor coaches have an economic status which excludes them both from the class which travels in its own automobiles and from that which uses the trains—day coach as well as Pullman facilities. If this observation be true, then the long-distance motor coach has built up a class of passengers which, except for the low rates offered by long distance motor coaches, could not afford to travel at all.

Some railroad men who have studied this situation have arrived at the opinion that the railroads ought to provide for passengers of lower economic status, for the purpose of bringing in new revenues to supplant those which have been lost by the decline in first-class day coach traffic. This suggestion has been strenuously opposed, however, by others who see in the proposal a threat to the basic railroad rate of 3.6 cents a mile.

Maintaining First-Class Rates

Upon one point there can be general agreement: Nothing should be done which will jeopardize the net income from passenger business, or (possibly more accurately) which is likely to result in a further net loss in handling such traffic. Proceeding on this assumption, it certainly follows that the rates for sleeping and parlor car service (including both the rail and Pullman charges) should stand unchanged—since this service at present rates has proved its attractiveness in spite of the fiercest competition. There is also a great volume of traffic moving in day coaches at prevailing rates and it would, manifestly, be folly to make a change in a rate which would bring only a few more passengers and would actually decrease gross revenues. But is this the only alternative? Cannot an experiment, at least, be made in attracting passengers of lower economic status without at the same time threatening the present-day coach rate of 3.6 cents a mile?

Perhaps the answer is to be found in the recent improvements which the railroads have been making in their day coach service—bucket type seats, superior sanitary arrangements, free observation car privileges, reserved seats, etc. By providing such facilities at the rate of 3.6 cents a mile on some trains, have not the railroads actually created a new class of service intermediate between day coach service of the old style and Pullman service? If service of this character can be given for 3.6 cents a mile as an experiment in attracting business, would it not be equally logical to provide service of the older style (which still persists to a large degree) at a rate lower than 3.6 cents per mile? If the long distance motor coaches by charging rates considerably less than the railroad day coach rate have drawn their business, not from the railroads primarily, but rather from classes of persons who could not travel at higher rates, does it not seem reasonable to assume that the railroads also might make a successful bid for this class of patronage without seriously competing with their modern de luxe day coach service? Under such

an arrangement we would have three classes of service: Pullman at the present rates of about 4.5 or 5 cents a mile; first class, in modern day coaches at 3.6 cents a mile; and second class, in the older day coaches, at a rate to approximate that of the long distance highway motor coaches.

A New Class of Traffic To Replace the Lost

We advance the above idea rather as an hypothesis than as a final opinion—with the realization that the problem will not be solved by theorizing. On the other hand, hypothesis generally precedes experiment, which alone can determine finally the merit of a proposition. The examples of the blacksmith who gradually developed a garage business and the phonograph dealer who added radio supplies to his stock show that a change in public demand need not in all cases prove a hardship to the alert supplier of human wants. The most likely field to provide passenger business to take the place of that lost to the private automobile appears to be the great mass of the people of very modest means who formerly did not travel at all. The long distance motor coach lines have proved this class to be productive of heavy business if their price handicap can be met. Cannot some way of doing this be evolved which would not endanger existing Pullman and first-class rates—some method which will increase, rather than decrease, the net revenues derived from passenger business?

The third-class immigrant traffic used to be the backbone of trans-Atlantic steamship travel just as day coach passengers used to make up the bulk of railroad passenger business. Restriction of immigration dealt a blow to this traffic even more thoroughgoing than the automobile did to the American railroads. But the steamship lines found the answer in developing tourist third class, cabin class and one class service. Persons who a decade or two ago would never have even contemplated an European trip are now in thousands making the journey. Is there not a suggestion here for the solution of the passenger traffic problem of the American railroads?

More Test Data Needed

BRIDGE engineering is undoubtedly one of the most exact of the applied sciences. A knowledge of higher mathematics is a prerequisite for proficiency as a designer, but, having this knowledge, he can place greater reliance on the results of mathematical calculations than in most other fields of engineering. This was not always true. The pioneer bridge engineers had to cope with meager information concerning the properties of the materials, which they applied with the aid of none-too-well developed theories of structural design. Lack of exact information as to both loading effects and the stresses to be realized under certain combinattions of conditions made it necessary to resort to judgment or an intuitive sense of adequacy. That their structures have performed valuable service under loads far greater than those predicating their design can be explained by nothing short of a high order of genius.

While judgment is a valuable aid to the engineer, the line of demarcation between judgment and guesswork is so ill-defined that neither should be allowed to serve as a substitute for knowledge of the facts when such knowledge is available. It is by reason of the bridge engineer's appreciation of this truism that he has fostered laboratory and steel tests for the ascertainment of physical facts. This has given rise to the investigation of columns, pins, riveted joints, roller bearings and the impact effect of moving trains, and as a result of such research the bridge designer is able to apply theoretical or empirical formulas in the proportioning of parts where his predecessors were compelled to rely on judgment. This in turn has increased the economy of design, because uncertainty breeds caution, which in bridge design means the use of more material than would probably be applied if accurate data were readily available.

The modern bridge is, therefore, a more accurately and economically designed structure than the bridge of a quarter century ago. But there are still certain factors of uncertainty which, if cleared up by suitable experimental work, would result in further economies in bridge design. The railways spend large sums of money each year for new bridges, and it is certain that the economies to be realized by the application of information with reference to points concerning which there is now uncertainty would far exceed the cost of obtaining this information by means of properly conducted scientific tests.

Equipment Orders for January and February

DURING January and February orders were placed by the railroads of the United States for 179 locomotives, 22,563 freight cars, 192 passenger-train cars and a total of 192,065 tons of rail and structural steel. That, briefly, is the story of activity in the major railway equipment markets during the first two months of 1930.

This two-month period was particularly encouraging for the locomotive builders, since the number of locomotives ordered was nearly double the 96 units of motive power purchased in the corresponding months of 1929, and fully 50 per cent larger than the number bought in the first two months of any of the last five

years. In other branches of the equipment industry—although in no case can the 1930 figures be considered as discouraging—results were somewhat less satisfactory, if judged by the standards set in the opening months of last year. Freight car orders were about 4,300 less than the 26,845 for which orders were placed in January and February, 1929; passenger car orders were 192 this year as against 249 last year, and rail and structural steel orders fell below the total of 213,799 tons ordered in the first two months of last year by 21,734 tons, or approximately 10 per cent.

As a result of the large increase in locomotive purchases, however, the total value of equipment ordered in January and February, 1930, is very nearly equal to the value of that ordered in the same months of 1929, while orders for all types of equipment are slightly above the average January and February orders of recent years.

In contrast to conditions at the same time last year, when no inquiries at all were listed for passenger train equipment, inquiries are now outstanding for a total of approximately 220 passenger train cars. Inquiries have also been issued within the last few weeks for some 40 locomotives and over 4,000 freight cars, so that equipment buying on a large scale appears likely to continue throughout the month of March.

Economies Accomplished by Centralized Signal Control

THE increased safety for train operation made possible by the installation of signaling equipment is easily understood. The saving in operating expenses accomplished by a reduction in running time and in fuel consumption is, in many cases, very evident, but nevertheless difficult to calculate. For this reason special interest attaches to the data presented in an article elsewhere in this issue describing the recent installation of centralized signal control on 43 miles of single track on the Missouri Pacific, between Edgewater Jct., Kans., and Atchison.

In the first place the elimination of three mechanical interlocking plants and the changes in operators made possible by the new installation permitted a reduction in wage costs equal to a 20 per cent return on the investment for the centralized control equipment. Furthermore, the running time of through freight trains has been reduced about 43 minutes, or one minute per mile of the installation. Also, the reduction in the number of train stops resulted in a saving of 390 tons of coal each month. Such facts should make evident to other roads the thought that they might well study the operating conditions on busy sections of their lines to ascertain whether they might also be able to improve operation at such places by the installation of signaling equipment. The Committee on Economics of Signaling, of the Signal Section, A. R. A., has prepared forms to be used for making such studies.

Fuel Savings in 1929

BY steadily reducing, since 1922, the amount of fuel required to handle a given amount of traffic, the railways last year saved practically one ton of coal every second.

In 1922, the year before the adoption of the railway's program of increased economy and efficiency, 163 lb. of coal were required in freight service to move a thousand tons a distance of one mile, and 17.9 lb. of coal were required in passenger service to move a passenger train car one mile. In 1929, the amount of fuel required to perform this same work was reduced to 125 lb. in freight service and to 14.8 lb. in passenger service, these reductions amounting to 23 per cent and 17 per cent respectively.

The meaning of this increased efficiency in the utilization of fuel is vividly illustrated by the fact that in the last seven years it has resulted in saving a total of approximately 130,000,000 tons of coal. At the average load per car of coal, this total tonnage saved is equivalent to more than 2,400,000 carloads. The savings in 1929 alone amounted to 30,412,000 tons of coal. This is equivalent to an average daily saving of more than 83,000 tons; to an average hourly saving of 3,472 tons; or to an average saving per minute of 58 tons—almost one ton a second.

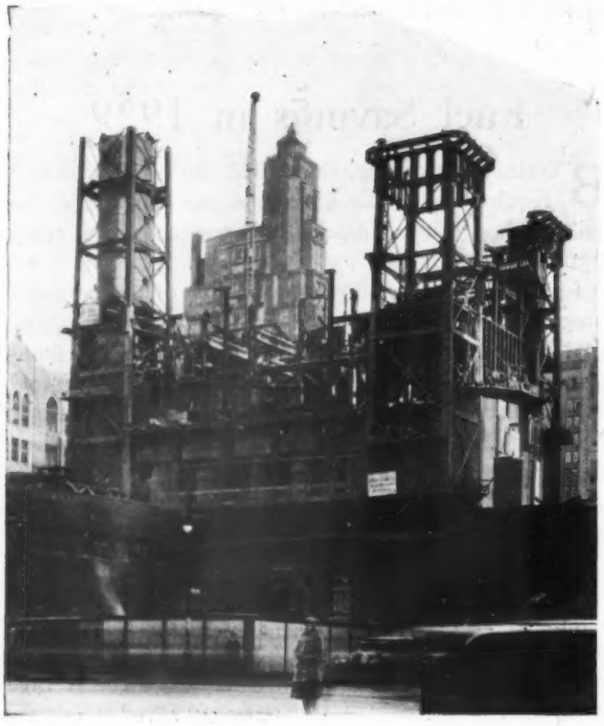
On the basis of the average prices prevailing for railway coal since 1922, this 130-million-ton fuel saving amounts to a money saving of $338,000,000, of which $73,000,000 is attributable to the year 1929 alone. It is highly significant, however, that this $338,000,000 saving, large as it is, would have paid less than 85 per cent of the railways' taxes last year.

The marked improvements in railway fuel use shown in the last seven years are due, of course, to the modern motive power provided, to the installation of various fuel-saving devices, to the elimination of train stops by the addition of signals, etc., to reduced train resistance resulting from stronger track construction, to employee education and improved morale, etc. It is noteworthy further that last year marks the seventh consecutive record set in efficiency of fuel use in railway freight service and the sixth consecutive record in passenger service.

As regards the increased work done by the same amount of fuel, the figures show that while one pound of coal was sufficient, in freight service, to move a ton for the distance of 6.13 miles in 1922, one pound of coal was sufficient in 1929 to move a ton eight miles, an increase in work accomplished of 31 per cent, or practically one-third.

Power and Heat for the Grand Central

Large substation and and completely re- under difficult con- interruption of



Old Plant and Substations at 50th Street, in the Process of Being Dismantled

ELECTRIC traction may alter conditions in a city completely when overhead rights are involved. This in turn will influence the location of railroad facilities. A situation of this kind, of more than usual interest, has been met by the New York Central in the Grand Central area in New York.

The area from 42nd street north to 50th street, and from Lexington Avenue west to Madison avenue, covering 16 city blocks, includes 28 buildings which receive electric power and light and 24 buildings which receive steam, hot water and fire service from the New York Central Railroad.

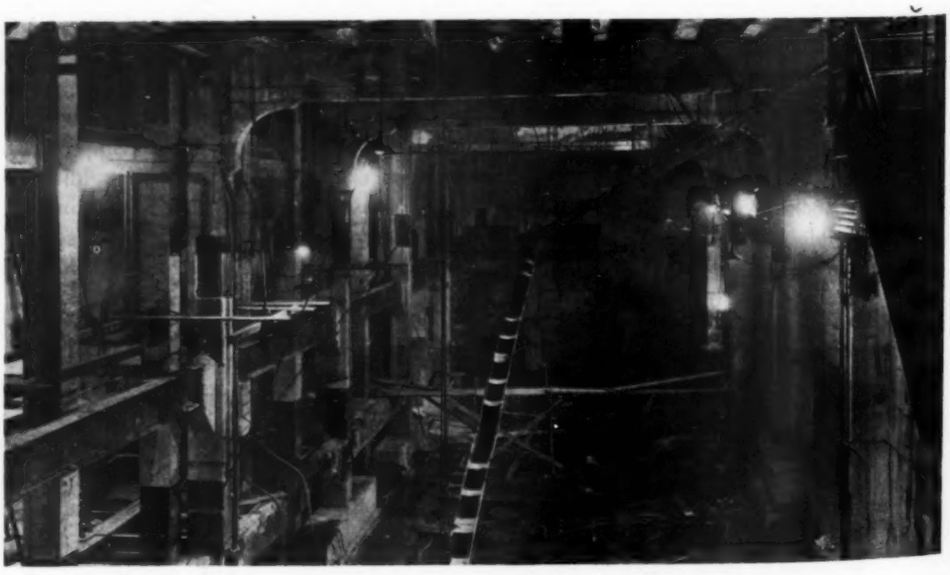
The new Waldorf-Astoria hotel is to occupy the entire space from Park avenue to Lexington Ave., between 49th street and 50th street. A steam plant, a hot water heating plant, including hydraulic machinery for operation of elevators, fire pumps, etc., an electric traction substation, a lighting substation, and a stand-by battery house were formerly located on this site. A second steam station was located at 43rd street at Lexington avenue, the basement of which was 100 ft. below the street level and 50 ft. below sea level.

On March 4, 1929, decision was reached to dismantle the two New York Central steam stations and to move the two substations and the stand-by battery into the space formerly occupied by the 43rd street steam station, and to purchase all steam from the New York Steam Company.

All traction power distribution lines in the original installation radiated from the 50th street substation. Service could not be interrupted and to provide for this a circuit breaker house was first built at 49th street with distribution lines radiating from that point. Feeders were then run from the 43rd street site to the circuit breaker house and also from the old substation at 50th street. As soon as control apparatus could be installed at 43rd street, machines were removed from the 50th street substation and moved one at a time to 43rd street and placed in service at that point.

Several of the buildings in the area are heated with hot water and this required that five steam water heaters, similar in construction to tubular condensers, had to be moved from the 50th street steam plant to the 43rd street substation. These heaters each weigh 20 tons. The principal pieces of electrical equipment moved were one 4000 kw., 600-volt rotary converter, two 2,500 kw., 600-volt rotary converters for traction power, four 1500 kw., 250-volt rotary converters, and one 2000 kw. rotary converter for lighting and building power supply, together with all of the air blast transformers necessary for this type of equipment.

It was not practical to move the machinery on the



Old Plant at 43rd St. After Boilers and Machinery Had Been Removed

Terminal Area

heating plant moved
built in nine months
ditions without any
power supply

The New Waldorf-Astoria Which Will Occupy the Space Bounded by Park Ave., Lexington Ave., 49th St., and 50th St.

streets and the batteries could not be moved in this manner because of a law which prohibits the transporting of acid in open containers on the city streets. One at a time the rotary converters were disassembled and lowered through a hatchway in the floor of the substation onto flat cars on the tracks below the old substation. These cars were moved as close as possible to the 43rd street station and the parts lowered again through a hatchway onto the operating floor. The old substation was equipped with a 15-ton crane, heavy rope blocks were used for lowering the parts through the hatchways, and a 35-ton crane in the new substation was used for the reassembling of the parts. The heaviest parts of the converters were armatures which weighed 30 tons each. The unloading of the cars had to be done from tracks which, because of traffic considerations, could be kept out of service only a few hours at a time.

The stand-by battery for the 250-volt lighting power having a one-hour rating of 8000 ampere-hours, includes 160 cells each weighing 4,550 lb. Each cell consists of a large lead-lined wooden tank, 7 ft. long, 2 ft. wide and 2¾ ft. deep, filled with lead plates surrounded by sulphuric acid solution. These batteries which stand on porcelain insulators were raised to the necessary height with automobile jacks and placed on trailers towed by electric tractors. They were removed to a second hatchway and lowered onto one of the ramps between tracks. They were then towed by electric tractors to 43rd street. In addition to being hauled, each cell had to be lowered by tackle a distance of 55 ft. at 50th street and raised by elevator at 43rd street. No acid was removed and by careful handling none was spilled. Of more importance than this, none of the cells was injured. A control battery and a signal battery were also moved and installed in the new plant.

Transfer of the hot water heating system was the most critical operation because of the limited time involved. About one-third of the heating in the terminal area is done with hot water. Due to the height of the buildings, three distinct systems with different pressures are operated. The heating is done in the five large heaters mentioned previously. These heaters could not be released from service until May 27 and had to be ready for service on September 20. No other means existed to supply hot water heat unless they were successfully installed and connected to the necessary steam pipes, pumps and hot water mains. Every man available was used on this operation and it was the principal objective until accomplished. The heaters were ready for service on September 19.

The New Substation at 43rd St.

The original 43rd street boiler plant consisted of an

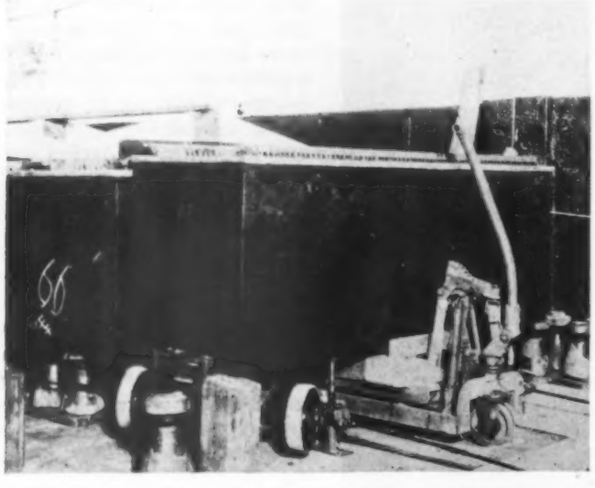
Interior of Circuit Breaker House

excavation about 100 ft. deep, 225 ft. long and 60 ft. wide in solid rock between the Commodore Hotel and the Graybar building on Lexington avenue. The roof of the plant was a private street; an extension of 43rd street. The plant consisted of four floors, a basement for the handling of ashes, a boiler room, a meter room and coal bunkers. The stack extended to the top of the Commodore Hotel and was concealed within that structure.

The New Substation

To convert this building into a substation it was necessary to remove the boilers, enlarge the basement, construct concrete foundations for the rotaries, provide an operating floor filled with conduits and with spaces for transformers, switchboards, oil switches and other apparatus. Crane girders and a 35-ton electric crane were provided.

The meter room was transformed into an exhaust fan room, taking the ventilating air from the top of the substation through the converters and transformers and into the boiler breeching and thence up the stack. The air for the converters is taken in from the track level area and also from a point near the 10th floor of the Graybar building. What had formerly been bunker space was converted into a stand-by battery room.

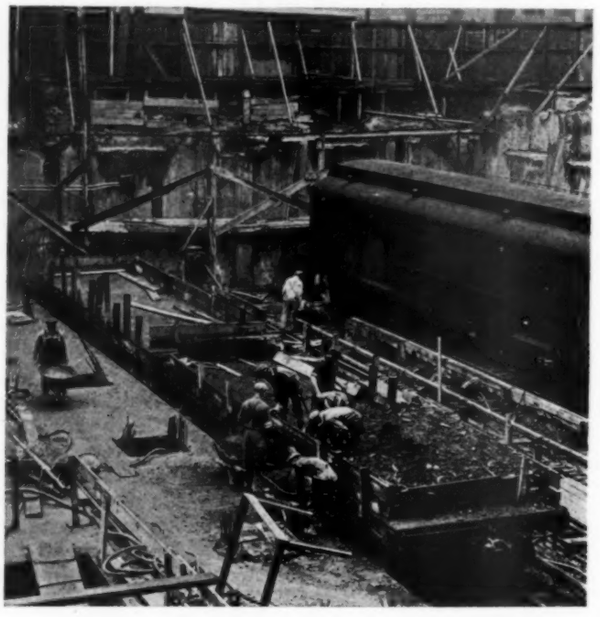


Automobile Jacks Were Used to Raise the Batteries Off Their Supports and Lower Them Onto Trucks

The substation is now said to be the largest in the world. In addition to the rotary converters moved, two new 4000-kw., 600-volt and one 2,500 kw. 222-volt machines were added. The steam-driven air compressors at the old plant were replaced by motor-driven compressors at 43rd street. Practically all of the switch gear included in the new substation is new equipment. Three hundred and fifty thousand cubic feet of air per minute are required and this is taken in through continuous self-cleaning air filters. The old substation was equipped with unit-type filters which had to be cleaned at intervals.

Difficulties Involved

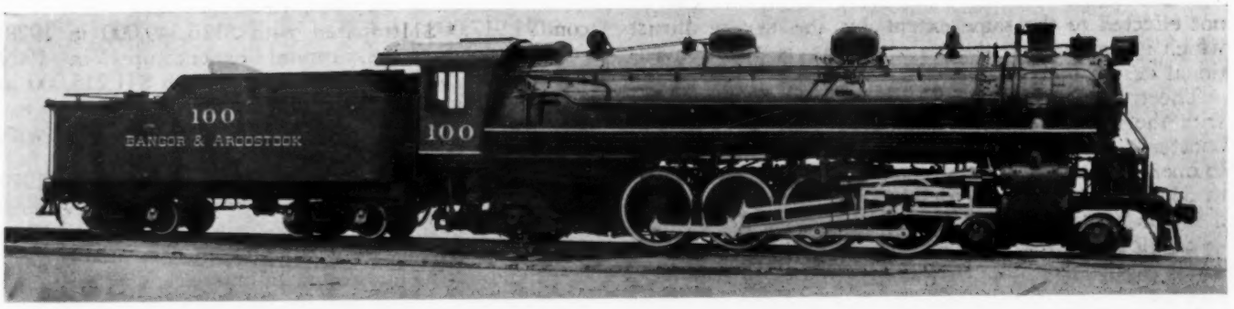
Only one who has had occasion to do underground work in a large city can appreciate the many difficulties involved. A wide diversity of engineering knowledge was required. For example, it was necessary to do such different things as to allow for proper expansion of a 20-in. steam line as compared with the setting at



Future Site of the Waldorf Astoria Showing Tracks which Will be Used as a Private Railroad Siding

its proper rating of a reverse-current relay on a high-tension circuit. To pre-determine the amount of cables necessary to maintain the voltage in every part of the terminal is quite a different problem than that of providing sufficient ventilation for an underground substation.

Some conception of the magnitude of the work may be obtained from the fact that outside the substation there were installed 20 miles of 3½ in. conduit and 30 miles of cables varying in size from 000 to 2,000,000 c.m. The substation alone required about 75 tons of bus bar copper. The work which was started on March 4, 1929, was scheduled for completion on January 1, 1930, was actually completed on December 24, 1929. Due to the speed required, it was necessary to make plans as the work progressed. All available help had to be used, including the New York Central electrical forces, those of the contractor, Thompson-Starrett Company and many local electricians. The work was done under the direction of F. B. Freeman, chief engineer, New York Central.



One of the 4-8-2 Type Locomotives Built for the Bangor & Aroostook by the American Locomotive Company

Freight Locomotives for the Bangor & Aroostook

Mountain types purchased to supplement Consolidation types in through freight service

THE Bangor & Aroostook recently placed in freight service four 4-8-2 type locomotives which were built by the American Locomotive Company. These locomotives, which are known on the road as the class M, have been assigned to through freight service between Northern Maine Junction, Me., and Oakfield and between Northern Maine Junction and Houlton. They supplement a number of 2-8-0 type locomotives, known on the road as class G, which are now being used on similar runs over the same territory or have been assigned to other districts in through and local freight service.

The 2-8-0 type locomotives were purchased in 1924. They exert a tractive force of 41,400 lb. The new 4-8-2 type locomotives have a rated tractive force of 50,000 lb. These locomotives, however, are equipped with Franklin trailer-type boosters having a tractive force of 11,300 lb. This gives the new power a combined tractive force at starting of 61,300 lb. Each of the new freight locomotives has 22½-in. by 30-in. cylinders, 62-in. driving wheels and operates at a boiler pressure of 240 lb. The total weight is 303,000 lb., of which 204,000 lb. is carried on the driving wheels. The factor of adhesion is 4.08.

Features of Design and Special Equipment

The new class M locomotives are equipped with Nicholson Thermic Syphons, Franklin trailer-type boosters, Superior soot blowers and type A superheaters. Chambers front-end throttle valves designed to allow superheated steam to be passed to all auxiliaries have also been applied. In addition, each of the four locomotives are equipped with back-pressure gages and superheater pyrometers. The boilers are of nickel steel having an ultimate tensile strength of 76,000 lb. and have Pitkin flexible staybolts.

A novel design of crosshead and guide yoke has been applied to these locomotives. The guide supports are secured to a steel casting which eliminates any possible distortion due to the expansion or concentration of the cylinders. It is believed that this design also improves the balance of the main rod and assists to a considerable extent in the balancing of all the reciprocating weights. The side rod arrangement is the railroad company's design which eliminates the use of knuckle pins. The main and intermediate driving boxes are of the floating-bushing type known as the Brooks type box. This design of box provides a uniform wearing service and is

Principal Dimensions and Weights of the Bangor & Aroostook 4-8-2 Type Locomotives

Railroad	Bangor & Aroostook
Builder	American Locomotive Company
Service	Freight
Rated maximum tractive force	50,000 lb.
Tractive force, booster	11,300 lb.
Comb. tractive force, starting	61,300 lb.
Weight on drivers ÷ tractive force	4.08
Cylinders, diameter and stroke	22½ in. by 30 in.
Valve gear, type	Baker
Weights in working order:	
On drivers	204,000 lb.
On front truck	48,000 lb.
On trailing truck	51,000 lb.
Total engine	303,000 lb.
Tender	181,500 lb.
Total engine and tender	484,500 lb.
Wheel bases:	
Driving	16 ft. 6 in.
Total engine	38 ft. 1 in.
Total engine and tender	73 ft. 8 in.
Wheels, diameter outside tires:	
Driving	62 in.
Front truck	30 in.
Trailing truck	42 in.
Boiler:	
Steam pressure	240 lb.
Fuel, kind	Soft coal
Diameter, first ring, inside	74 in.
Firebox, length and width	112⅛ in. by 84¼ in.
Tubes, number and diameter	208—2 in.
Flues, number and diameter	38—5¾ in.
Length over tube sheets	20 ft.
Grate area	65.6 sq. ft.
Heating surfaces:	
Firebox and combustion chamber	267 sq. ft.
Arch tubes	13 sq. ft.
Thermic syphons	71 sq. ft.
Tubes and flues	3,232 sq. ft.
Total evaporative	3,583 sq. ft.
Superheating	932 sq. ft.
Comb. evaporative and superheat	4,515 sq. ft.
Tender:	
Water capacity	10,000 gal.
Fuel capacity	15 tons

not effected to the same extent by the severe thrust which is imposed on the main axle as is the conventional design of boxes.

The trailer truck is of Commonwealth Delta design with the frame especially adapted for the Franklin booster. The booster cylinders have been bushed down to operate with a steam pressure of 240 lb. The weight of 51,000 lb. which is carried on the trailing truck gives a factor of adhesion for the booster of 4.51.

The locomotives have a grate area of 62 sq. ft. and are designed for the future application of Standard stokers.

The tender has a Commonwealth steel frame and is carried on two four-wheel trucks. It has a water capacity of 10,000 gal. and a fuel capacity of 15 tons.

Capital Expenditures in 1929

WASHINGTON, D. C.

CAPITAL expenditures by the Class 1 railroads in 1929 for new equipment and additions and betterments to property used in transportation service totaled $853,721,000, according to complete reports for the year compiled by the Bureau of Railway Economics. This not only exceeded the estimate, of $800,000,000, but was the largest amount expended for such purposes in any year since 1926, when capital expenditures totaled $885,086,000. Capital expenditures in 1929 were greater by $177,056,000 than in 1928 and greater by $82,169,000 than in 1927.

Unexpended authorizations representing physically uncompleted work were carried over into 1930 from 1929 to the amount of $624,310,000, the largest amount of carryover found on the books of the railroad companies on any January 1 on record. The projects included under these authorizations for $624,310,000 of capital expenditure will be carried to completion as rapidly as possible during the current year, along with additional projects that will be authorized between now and the end of the year. The amount of the additional authorizations, however, can not be estimated at this time.

The unexpended authorizations carried over into 1930 included $183,908,000 for equipment and $440,402,000 for roadway and structures. In both instances, the amounts represent the largest amount of unexpended authorizations from physically uncompleted work ever carried over from one year to another.

Capital expenditures during the final quarter of 1929 amounted to $279,901,000 compared with $176,498,000 during the corresponding three months of 1928. This was an increase of $103,403,000 or 58.6 per cent. Expenditures for new equipment totaled $110,617,000 compared with $58,334,000 in the final quarter of 1928, an increase of 89.6 per cent. Expenditures for improvements to roadway and structures amounted to $169,284,000 compared with $118,164,000 in 1928, an increase of 43.3 per cent.

The amount of capital expenditures devoted in 1929 to purchase of equipment was $321,306,000 compared with $224,301,000 in 1928. This was an increase of $97,005,000 or 43.2 per cent above the preceding year.

Roadway and structures expenditures aggregated $532,415,000 compared with $452,364,000 in 1928, or an increase of $80,051,000 or 17.7 per cent.

Capital expenditures made in 1929 for locomotives amounted to $70,660,000 compared with $51,501,000 made in 1928. For freight cars, expenditures amounted to $191,917,000 compared with $116,549,000 in 1928. For passenger cars, capital expenditures in 1929 amounted to $38,670,000 compared with $41,215,000 in the preceding year. For other equipment, capital expenditures amounted to $20,059,000 compared with $15,036,000 in 1928.

Capital expenditures for additional track in 1929 amounted to $129,148,000 compared with $116,494,000 in 1928. For heavier rail, expenditures totaled $46,862,000 compared with $47,192,000 the year before. For shops and engine houses, including machinery and tools, expenditures totaled $36,561,000 compared with $24,324,000 in 1928. Expenditures for additional ballast showed an increase, from $15,748,000 in 1928 to $17,049,000 in 1929. For all other improvements, $302,795,000 were expended during the past year compared with $248,606,000 in 1928.

Capital expenditures made each year since the close of federal control in 1920 have been as follows:

1920	$653,267,000
1921	557,036,000
1922	429,273,000
1923	1,059,149,000
1924	874,744,000
1925	748,191,000
1926	885,086,000
1927	771,552,000
1928	676,665,000
1929	853,721,000
Total—Ten years	$7,508,684,000

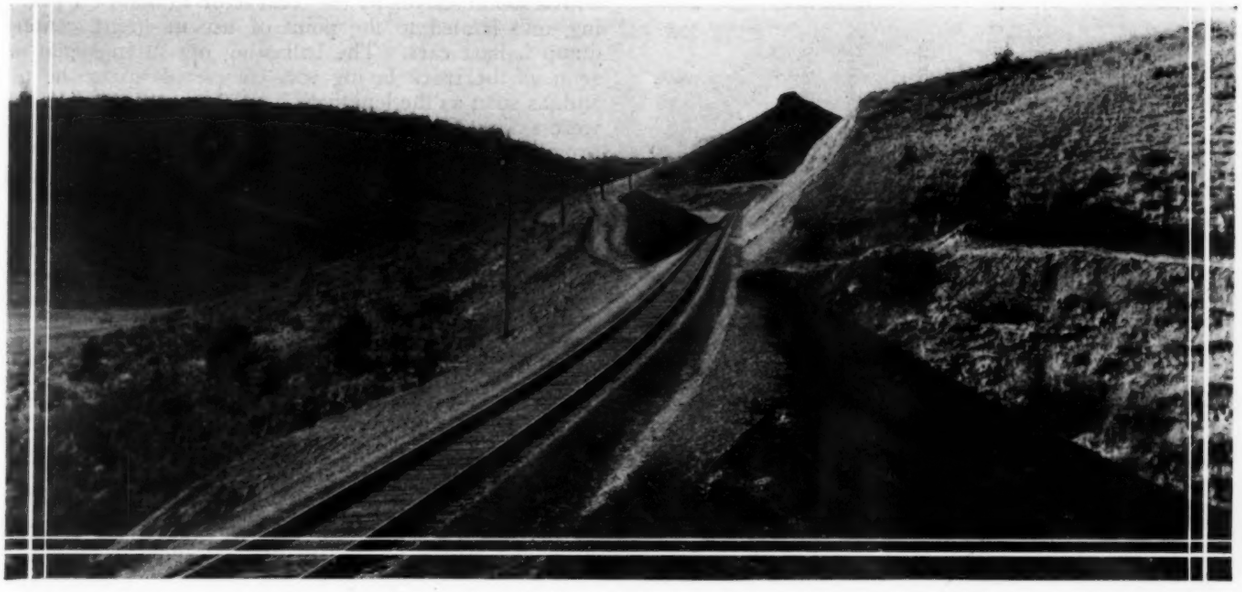
Capital expenditures during this ten-year period aggregated seven and one-half billions of dollars, or $750,000,000 per year. Expenditures during 1929 exceeded this average by $103,000,000 and were exceeded by the expenditures of only three previous years—1923, 1924 and 1926.

PRESIDENT COLINDRES of Honduras has prepared plans for an interoceanic railway with its Pacific terminal at some point on the Gulf of Fonseca, according to press despatches. The construction would be completed in about seven years under arrangements with American, British and French capitalists.

* * *

Atlantic Coast Line Photo

An Atlantic Coast Line Train Southbound Near Moncrief, Fla.



A Section of Completed Track on the Southern Pacific's New Alturas Line

Southern Pacific Completes New Traffic Link

Alturas line shortens route to the East by 200 miles and saves much rise and fall

WHEN the Alturas-Klamath Falls line of the Southern Pacific was opened on September 14, last, it marked the completion of a new link in the system, which provides that road with another and shorter route between Portland, Ore., and the East, via Ogden, Utah, at the same time materially reducing the total rise and fall and eliminating a large amount of curvature. The new line, which was constructed at a cost of more than $5,000,000, extends from Klamath Falls, Ore., to Alturas, Cal., thus closing the last gap in a new route to the East, which, as shown on the map, includes the old main line from Portland, Ore., to Eugene, from which point the new Cascade line is used to Klamath Falls. At Alturas, connection is made with the old Nevada-California-Oregon narrow-gage railway which was acquired by the Southern Pacific several years ago, and which has since been widened to standard gage, at a cost of approximately $4,000,000. The Nevada-California-Oregon is then utilized to Fernley, Nev., east of the summit over the Sierra Nevada mountains where connection is made with the main line of the Southern Pacific, which extends from San Francisco, Cal., to Ogden, Utah.

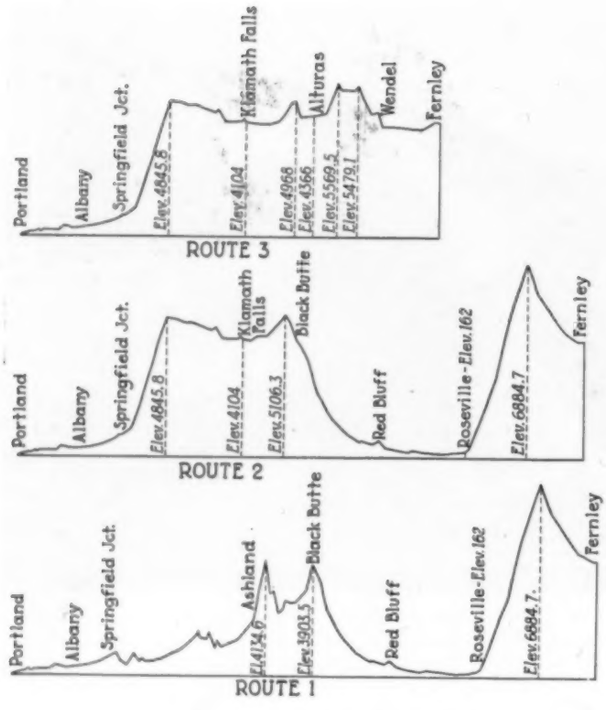
Advantages of the New Line

The advantages of the new line will at once be apparent from a study of the accompanying map and condensed profile. Route 1 is the original line, over which it was necessary for the Southern Pacific to handle traffic eastbound from Portland, before the Cascade line was built. At that time, the freight had to be hauled over the Siskiyou line to Roseville, Cal., a few miles east of Sacramento, and thence east. After the Cascade line was built, Route 2, through Eugene, Klamath Falls and Roseville was available. This latter line is 25 miles shorter than the Siskiyou line, saves 2,869 ft. in rise and fall, and has 19,024 deg. less curvature. The new route, which is indicated as Route 3 in the condensed profiles, is 235 miles shorter than Route 1, with a reduction of 8,037 ft. in rise and fall, and of 43,532 deg. of curvature, while it is 210 miles shorter than Route 2 and has 5,168 ft. less rise and fall and 24,508 deg. less curvature.

The savings which can be effected in time and in operating expenses on through business moving between Portland and eastern points by way of the new line, are readily apparent, as compared with both the Siskiyou line and the newer Cascade line. The new route also possesses an added advantage, as it removes the traffic from the busy main line in the section where it crosses the Sierra Nevada mountains between Roseville and Fernley.

Characteristics of the Line

From the junction with the Cascade line at Klamath Falls, the new line extends southeasterly, passing through the Klamath irrigation project which the government is developing around the now dry bed of Tulle



The Alturas Line (Route 3) Possesses the Advantages of Less Mileage, Curvature and Gradient

lake, crossing the Oregon-California state line and thence southeasterly and easterly, 37 miles, through the Modoc National Forest to Alturas. In this forest it was necessary to clear the right of way through a heavy stand of virgin pine timber and here, also, some of the heaviest grading was encountered.

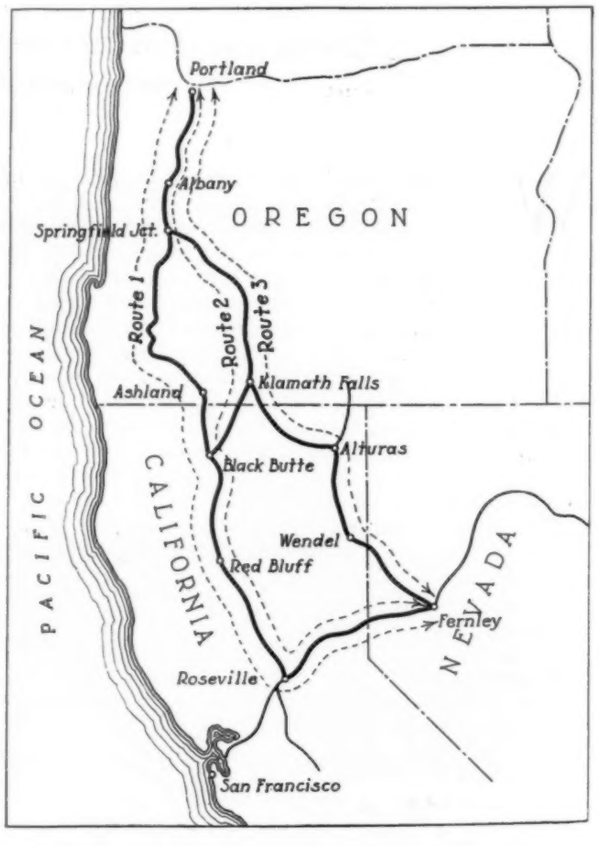
The country traversed is primarily a high plateau covered with heavy deposits of pumice and lava, indicating intense volcanic activity at some time in the past. In general, this plateau lies at an elevation of about 4,100 ft. above sea level, although a short distance west of Alturas, a summit is crossed, at an elevation of 4,968 ft., the highest point reached on the line. This summit is 864 ft. higher than Klamath Falls and is 602 ft. above the elevation of Alturas. The ruling grades are 2.2 per cent westbound and 1.0 per cent eastbound. The total curvature amounts to 2,838 deg., the maximum degree of curvature being 10 deg. Seventy-three miles, or 77 per cent of the line are on tangent; 19.4 miles, or 20 per cent, consist of curves of 3 deg. or less; 1.9 miles, or 2 per cent, are on curves of 4 deg. to 8 deg.; while the remainder, 0.9 mile, or 1 per cent, range from 8 deg. to 10 deg.

Owing to the generally flat character of the country, the fills are light and the cuts shallow over a large part of the mileage. The heaviest work was encountered on both approaches to the summit west of Alturas, but, even here, the deepest cut is only 36 ft. The total grading involved the moving of about one million cubic yards of material, largely pumice and lava rock. The standard width of roadbed in cuts is 20 ft., with 1 to 1 slopes. On fills the width is 18 ft. with 1½ to 1 slopes. The track is laid with 75-lb. and 85-lb. relayer rail, with new 90-lb. rail on grades where helper locomotives are required.

The line is fully ballasted with gravel which was obtained from a pit located near Stronghold, about 29 miles from Klamath Falls. The gravel was loaded with a steam shovel, by the contractor who did the grading, and hauled to the point of use in 40-yd. center-dump ballast cars. The ballasting operation began as soon as the track laying was completed up to the pit and, as soon as the length of haul warranted, two trains were assigned to this service. As an indication of the progress made on this part of the work, the line was connected through on July 13, 1929, and was turned over to the operating department on September 14.

As a result of the topography, the water courses are numerous, but small, so that, while many culverts and trestles were installed, it was necessary to construct only six bridges of sufficient size to require steel spans. These include two 60-ft. deck girder spans, one 50-ft. through girder span and three 40-ft. deck girder spans. The trestles are all of the creosoted ballast-deck type, which are supported on either creosoted pile bents or concrete piers. A few creosoted timber culverts were built, but, in general, the culverts, which range from 12 in. to 72 in. in diameter, are of Armco corrugated iron.

Since the line traverses a country that is largely undeveloped, it was necessary to provide living quarters at points where employees are permanently assigned. Unusually substantial buildings were erected for this purpose. Section headquarters were established at five points, each of which includes a group of buildings, consisting of a foreman's dwelling, a bunk house for six single men, a six-family laborers' dwelling, a standard cook house, a double wood shed and a single wood shed. In addition, houses, similar to those erected for the section foremen, were built at several points for operators or agents. Each of the units is fully equipped with water, toilets, shower baths, Arcola heaters and septic tanks, and is enclosed by a neat board fence.



Vicinity Map, Showing the Three Alternate Routes

The Lava Rock Formation Added to Construction Difficulties

Because of the virgin character of the country the housing of the construction forces presented a serious problem which was solved by a method that was one of the novel features of the construction. Camps were established every 10 miles along the line, each of which consisted of a 70-ft. frame dining hall and tents with wooden floors for sleeping quarters. These camps were used progressively. As soon as an advance gang completed its work, it moved on to the next camp and another gang moved up to take over the quarters thus vacated.

Another construction difficulty encountered was the scarcity of water, and this condition was augmented by the unusually large number of work train movements, and the fact that stock men on the adjacent ranches began to ship cattle and sheep to and from points along the line almost as soon as the rails were connected. Temporary corrals were built by the construction forces for the accommodation of this traffic and the stock was hauled out by the construction trains. Since there was no supply available locally during this period, all the water that was used had to be hauled. As rapidly as possible, however, water stations were established, and temporary pumping facilities relieved the situation somewhat during the later months of construction.

In addition to the through traffic which will be routed over the new line, preparations have been made for handling a considerable amount of business of local origin which will be derived from forest products and live stock shipments, from the ranges in the adjacent territory. A part of the large stand of commercial timber in the Modoc National forest has been sold to a lumber company and this will constitute some of the first freight of local origin. Five large corrals have been constructed at stock shipping points, in addition to which a larger corral, having a capacity of 40 cars, has been constructed at Texum, Ore., the junction with the Cascade line, just south of the city limits at Klamath Falls. This corral is also to be used for feeding and resting stock in transit. Provision has been made also for handling shipments of farm products, such as hay, potatoes, fresh fruits and vegetables and dairy products.

Construction was started July 17, 1928, and was carried out under the general supervision of Geo. W. Boschke, chief engineer. A. J. Barclay was in direct charge of the field work. The Utah Construction Company had the contract for the grading and operated the gravel pit at Stronghold during the construction period.

LONDON ALONE HAS 9,000 PASSENGER TRAINS arriving at or departing from the principal stations every day. Waterloo has 1,400 passenger trains a day. Clapham Junction 1,730, and Baker Street 1,512, while Liverpool Street with its 1,200 trains claims to possess the most intensive steam-operated suburban service in the world. Glasgow's three principal stations deal with over 1,500 passenger trains in the working day, while the famous Waverly Station at Edinburgh has 1,000 trains. The day's work at Newcastle Central station consists of 950 passenger trains, at Aberdeen 300, at Manchester (Victoria) 780, at Liverpool (Exchange——), at Bristol 462, and at York 330.

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Temiskaming & Northern Ontario Track, with C. N. R. Train in Background, Noranda, Que.

The Missouri Pacific Installs

Centralized Signal Control

on 43 Miles of Single Track

From 40 to 50 trains handled daily, all movements being directed by signal indication

The Control Machine at Leavenworth

Eastbound Signal at West End of Wade

THE Missouri Pacific has recently placed in service a General Railway Signal Company centralized signal control system on 43 miles of single track between Edgewater Jct., (Kansas City) Kan., and Atchison, on which territory train movements are now directed by signal indications which supersede timetable superiority and take the place of written train orders. This is the most extensive installation of this system placed in service to date.

In this territory, power switch machines were provided at six single sidings, three lap siding layouts, two junctions and one yard entrance switch. At three other sidings which are used infrequently under the new system of operation, the switches are hand-thrown, but signals are provided for directing train movements. Twelve other main-line switches leading to house tracks or industry spurs are hand-operated, and movements to or from such tracks are made on authority from the dispatcher and are protected by signal indication. The operation of the power switch machines and the signals that govern train movements is controlled from a machine in the dispatcher's office at Leavenworth, Kan.

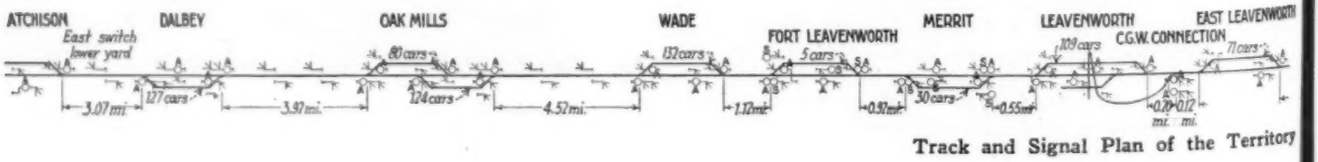
The Traffic Involved

The traffic varies on different sections of this territory. The Missouri Pacific operates 10 passenger and 6 scheduled freight trains and an average of 6 extra trains daily over the entire territory. The Chicago Great Western has trackage rights on this line between Edgewater Jct., and Leavenworth, between which points it operates 4 passenger trains and about 12 freight trains daily. The Union Pacific also operates 4 trains daily over a four-mile section between Cochrane and Leavenworth. In other words the traffic between Edgewater Jct., and Cochrane totals 40 to 50 trains daily, to which are added the 4 Union Pacific trains between Cochrane and Leavenworth, while from Leavenworth west to Atchison, the Missouri Pacific has from 22 to 28 trains daily. In busy seasons as many as 60 trains have been operated over this line in 24 hours.

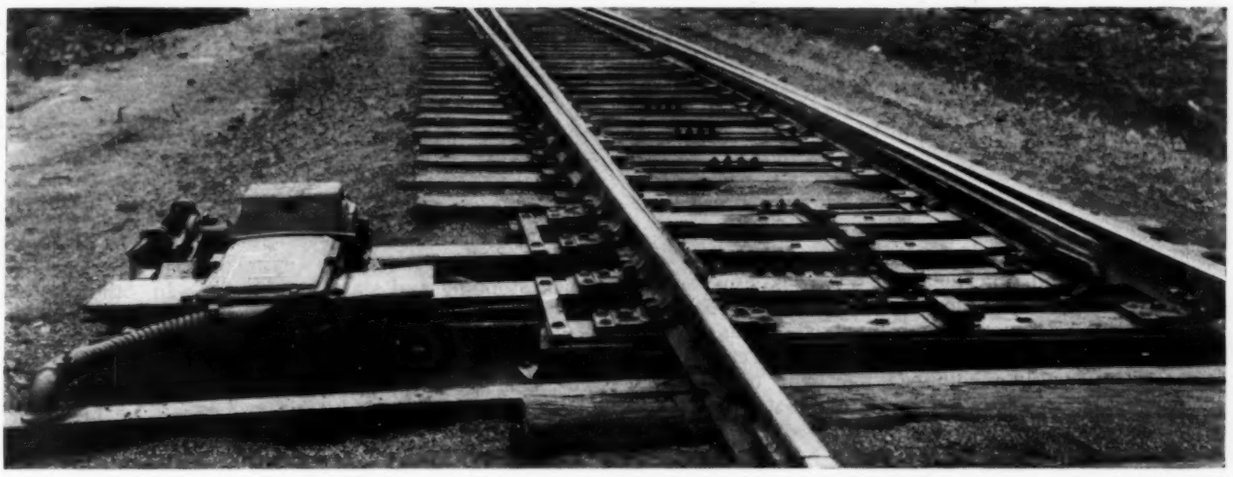
Physical Characteristics of the Line

Although the traffic is heavy, the large expenditure necessary for the construction of a second track is not justified when other means of increasing the track capacity and expediting train movement are available. The heavy cost of a second track is due to the fact that the line is built along the Missouri river and in many places is hemmed in by the river on the one side and by high bluffs on the other.

The line was built at practically water grade with only a few heavier grades which are short and of no



Track and Signal Plan of the Territory



The Power Switch Machines are Equipped for Dual-Control

consequence to train operation. The track is laid with 90-lb. rail and is in good condition to carry heavy traffic. At all passing tracks and junctions where power switch machines are used, new No. 20 turnouts were installed, to permit trains to pull in or out at a speed of 30 m.p.h. The class 2-8-0 locomotives readily handle the rated tonnage, 6,000 tons, and can make a non-stop run over the 43 miles in about 1 hr. 45 min., while through passenger trains, that make only one stop, are scheduled to make this run in 60 min. The maximum speed for freight trains is 35 m.p.h. and for passenger trains, 60 m.p.h.

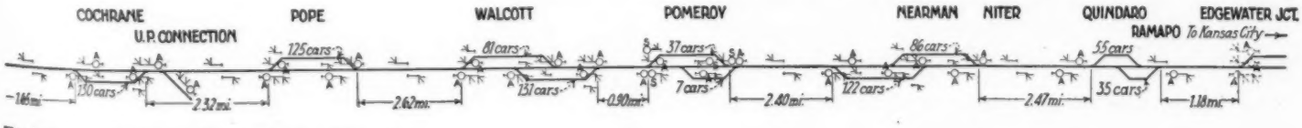
The Operation of the System

The operators at Minnesota Avenue tower in Kansas City, Kan., and at Atchison inform the dispatcher when trains destined for the centralized control territory pass their respective offices. In addition, the immediate approach of a train is announced by annunciators on the dispatcher's central machine. Likewise when a train enters the short track circuit at each control point, the fact is announced by an annunciator bell, and an indicator light for that respective track circuit or control point is illuminated and stays lighted until the entire train passes. The location of each train on the road is maintained by means of a token, consisting of a small metal peg with a tag on it giving the number of the train. When the arrival of a train is announced at a particular switch, by the lighting of the indicator light, the dispatcher inserts this token in a hole located at the corresponding location on the track diagram. This action automatically operates the corresponding needle on the train graph which makes a record of all train movements.

The dispatcher throws the levers to control the operation of the switches and signals to direct the movement of the trains as he desires. Normally all switches are kept set for the main line and controlled signals at "STOP." Throwing a lever down causes the corresponding track switch to move to the normal position, while throwing the lever up causes it to move to the reverse position. With the lever on center, the switch remains in the position to which it was last operated. The selection of signals for the direction of train movements depends on the sequence in which levers are operated; that is, levers must be manipulated ahead of the movement of a train across the machine. Moving a lever down causes the signal to display a proceed indication for a main-line movement, while if the lever is thrown up, an indication is displayed for a movement to or from the siding or junction. All of the signals are the color-light type; the main-line signals display red, yellow or green, while the dwarfs display purple, yellow or green.

At those switches which are not provided with power machines, but where signals are located to direct train movements, special light units are attached to the heading-in signal and to the leave-siding dwarf signal. When the dispatcher is ready for a train to leave such a siding, he places the lever for that control point in the up position, which causes this special unit to be illuminated, thus displaying a large letter "S." This gives the trainman authority to throw the switch after which the leave-siding dwarf signal indication changes from purple to either yellow or green, depending on whether one or two blocks ahead are clear. When it is desired to have a train head in at one of these sidings, the lever is placed in the up position, causing the letter "S" to be displayed below the signal giving a "Stop" indication. This directs the trainmen to operate the switch and the train to take siding.

When a movement is to be made into or out of one of the house tracks or industry spurs, where signals are not provided for the direction of train movements, the conductor calls the dispatcher for authority to switch between certain limits for a certain time, and during this time the main line is held either by leaving part of the train on the main line or by leaving the main-line switch open. In addition to the protection afforded by the dispatcher holding the controlled signals at danger on both sides of the territory being used, the automatic signals also operate to protect such a movement. Before the time limit expires, the train gets in the clear and the conductor informs the dispatcher to that effect or if



Equipped with Centralized Signal Control

the movement is complete, he gets permission to move on the main line. All such movements are normally made by switch engine crews, no local freight trains being operated on this territory. One switch engine works a short distance out from Edgewater Jct., and another is stationed at Leavenworth to handle the switching at this station as well as at Ft. Leavenworth. The dispatcher must arrange for these switching movements without delaying through trains.

All signals for directing train movements, that is, both main-line signals at each end of sidings as well as the signals on the junction lines and the dwarfs on the sidings, are absolute stop signals, and are so designated by a large letter "A" mounted on the mast. This letter is backed up with a Stimson reflecting glass, causing the letter to be readily seen in daylight and to stand out plainly by light reflected from a locomotive headlight at night. When a train stops at an absolute signal displaying a stop indication, the conductor at once enters the phone booth, which is located near each such signal, and calls the dispatcher who explains the cause for the train being stopped and the approximate time before it will be allowed to move again.

The power switch machines are equipped with dual control levers. If a train has entered the locking section approaching a switch before the dispatcher decides that the train should be headed into this siding, he stops the train at the signal, and by telephone informs the conductor to effect a release by moving the release lever to the opposite position and then restoring it, after which the dispatcher can operate the switch by power. In case the switch fails to operate on account of a failure of the battery supply, the trainmen may operate it manually under authority from the dispatcher.

The two-wire block telephone line formerly extending between the several stations and offices on this territory was connected through as one circuit and is now used exclusively for telephone communication between the dispatcher's office and the telephone booths located at each of the absolute signals. The dispatcher can use either a head set or a loud speaker which is located on the end of the control machine, although under normal conditions the loud speaker is preferred. In case the line wires of this circuit fail, any of the phones can be cut over on to another message phone circuit that is also cut into the dispatcher's office.

The Savings and Results

The installation of this centralized control installation has permitted the removal of three mechanical interlocking plants, one at Nearman, and another at Wolcott, each of which controlled the passing siding switches at the laps, and a third at Cochrane for controlling the switches at the U. P. junction and the east end of the passing track. The levermen-operators were removed from these towers while operators were also released at Oak Mills, Leavenworth and at the lower yard office at Atchison, a total reduction of 14 operators and 2 relief men.

Under the previous method of operation, the dispatchers were located at Atchison, and handled not only the Kansas City to Atchison district, but also the Northern Kansas division. These dispatchers were moved to Leavenworth to handle the centralized control territory and another set of dispatchers located at Atchison handles the Northern Kansas division and the district from Atchison to Omaha. The net result of the change has been the addition of one dispatcher for 6 days per week.

The installation of automatic block signals for this territory had been authorized prior to the decision to provide the centralized signal control system which resulted in an additional expenditure of about $130,000. The savings in wages alone represents about 20 per cent on this amount. In addition, the average running time of freight trains has been reduced about 45 min., or over one minute per mile. On the average about four stops have been eliminated for each through freight train; non-stop meets are made frequently, from three to five such movements being made daily at Oak Mills and as many as 15 in the entire territory. From a test made on this division, about 15 scoops of coal are consumed when stopping and starting a train. In other words about 390 tons of coal are being saved per month by the reduction in the number of train stops.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 1 totaled 899,189 cars, a reduction of 79,012 cars as compared with the corresponding week of last year and a reduction of 60,305 cars as compared with 1928. All classes of commodities except livestock showed a decrease as compared with the corresponding week of last year, but miscellaneous freight showed an increase as compared with 1928. All districts reported reductions as compared with both years, except the Southwestern, which showed increases as compared with both years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, March 1, 1930

Districts	1930	1929	1928
Eastern	203,217	232,515	218,188
Allegheny	183,574	196,537	187,109
Pocahontas	47,891	58,716	53,275
Southern	142,796	147,593	156,769
Northwestern	109,708	118,881	125,471
Central Western	131,272	143,705	143,076
Southwestern	80,731	80,254	75,606
Total Western Districts	321,711	342,840	344,153
Total All Roads	899,189	978,201	959,494
Commodities			
Grain and Grain Products	45,103	46,505	53,609
Live Stock	25,854	25,515	30,620
Coal	135,661	192,577	171,700
Coke	10,303	14,084	11,351
Forest Products	61,783	64,004	71,720
Ore	8,771	10,682	8,825
Merchandise L.C.L.	251,852	255,706	258,713
Miscellaneous	359,862	369,128	352,956
March 1, 1930	899,189	978,201	959,494
February 22, 1930	828,890	905,503	869,417
February 15, 1930	891,597	957,498	888,586
February 8, 1930	886,581	955,981	906,477
February 1, 1930	898,894	947,154	926,262
Cumulative totals, 9 weeks	7,754,575	8,315,792	7,999,131

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended March 1 totalled 59,840 cars, an increase over the previous week of 2,400 cars and a decrease of 9,230 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 1, 1930	59,840	38,205
February 22, 1930	57,440	38,431
February 15, 1930	57,130	38,763
March 2, 1929	69,070	48,699
Cumulative Totals for Canada		
March 1, 1930	500,815	329,218
March 2, 1929	545,923	374,842
March 3, 1928	564,152	345,737

One of the Locomotives Used in Long Run Service by the Great Northern

Long Engine Runs Used Effectively

Great Northern closes 14 terminals and increases locomotive efficiency

THAT the Great Northern has found it profitable to extend its locomotive runs is indicated by the fact that this measure has made it possible to close 14 terminals and to reduce the work at many others. The total cost of operation per locomotive mile has been reduced as much as 30 per cent in some instances, with an average reduction of about ten per cent. This applies to both freight and passenger service.

These long runs have not only tended to reduce delays at terminals, but they have also permitted a greater utilization of the larger and more modern power. This has resulted in faster movement and increased tonnage per train, both of which factors are clearly indicated in the improvement in gross tons miles per train hour on the G. N., from 16,607 in 1921 to 26,256 in 1928, an increase of 9,649 gross ton miles per train hour, or 58 per cent. This increase has been continuous, the 1928 figure, for example, being more than five per cent over the 1927 figure, which in turn was larger than the 1926 figure.

Table I—Passenger Engines

Trains	Present Runs Between	Miles	Former Runs Between	Miles
No. 13-14	Minneapolis-Fargo	251.0	St. Paul-Breckenridge	214.8
No. 9-10	St. Paul-Devils Lake	403.5	St. Paul-Breckenridge	214.8
			Breckenridge-Devils Lake	188.7
No. 1-2	St. Paul-Fargo	241.8	St. Paul-Barnesville	217.3
			Devils Lake-Minot	118.4
	Fargo-Minot	233.1	Barnesville-Grand Forks	102.7
			Grand Forks-Devils Lake	88.7
No. 7-8	St. Paul-Winnipeg	469.3	St. Paul-Barnesville	217.3
			Barnesville-Redland	80.1
			Redland-Winnipeg	158.6
No. 29-30	St. Paul-Grand Forks	320.0	St. Paul-Barnesville	217.3
			Barnesville-Grand Forks	102.7
	Grand Forks-Minot	207.1	Grand Forks-Devils Lake	88.7
			Devils Lake-Minot	118.4
No. 35-36	Duluth-Grand Forks	295.2	Duluth-Cass Lake	162.6
			Cass Lake-Grand Forks	132.6
No. 3-4	Grand Forks-Williston	327.4	Grand Forks-Devils Lake	88.7
			Devils Lake-Minot	118.4
			Minot-Williston	120.3
Nos. 1-2-3-4-27-28	Williston-Havre	309.4	Williston-Wolf Point	106.7
			Wolf Point-Havre	202.7
Nos. 1-2-3-4-27-28	Havre-Whitefish	256.2	Havre-Cut Bank	129.3
			Cut Bank-Whitefish	126.9
Nos. 1-2-3-4-27-28	Whitefish-Hillyard	269.2	Whitefish-Troy	134.5
			Troy-Hillyard	134.7

The Extended Runs

The longest run now made in passenger service is between St. Paul and Winnipeg, 469 miles, which passes through two intermediate terminals where engine changes were made formerly. The average length of the 36 passenger engine runs that have been extended is 287 miles. To protect these 36 runs, 72 engines were formerly necessary and their average mileage per run was 144 miles. In other words, the average length of these engine runs has been doubled, thus requiring only half the number of locomotives to protect the service. The details of the passenger runs are given in Table I.

The longest freight run is between Williston, N. D., and Havre, Mont., 309 miles, which takes the place of three former runs. This is the only case in freight service on the G. N. where three runs have been consolidated into one, the other cases involving the running of engines over two former engine districts. The average mileage of the present freight runs is 227 miles, an increase of more than 100 per cent. The detailed figures on the freight runs are shown in Table II.

Eliminating Terminals

While the Great Northern was one of the pioneers in extending locomotive runs, no attempt has been made at "stunting;" the work of extending the runs having proceeded along more orderly lines. Before extending any engine run, and particularly before closing down an engine terminal, the officers had made a complete study of each situation, and assured themselves that the contemplated action would effect economies, while, at the same time, providing for the same or better service.

Proceeding on this basis, the first terminal, that at Gold Bar, Wash., was closed on January 17, 1921, followed shortly by the closing of the terminal at Bowdoin, Mont., on February 27, 1921. On October 1, 1922, the extension of runs had proceeded to the point where it was possible to close the terminal at Wilson Creek, Wash., while, on the same date, the terminal at Leavenworth, Wash., was closed and the small terminal at Wenatchee (Appleyard) was enlarged to provide for more efficient engine handling. For the same purpose, on the eastern end of the railroad, the terminal at Melrose, Minn., was closed on Sept. 9, 1923, the existing engine terminal and yard at St. Cloud, Minn., having been improved and extended prior to that date.

Pending the arrival of new and improved power, no further terminals were closed or moved until 1925, during which year two terminals were closed, one at Judith Gap, Mont., on October 31, the other at Clancy, Mont., on November 30. This was followed by the closing of

four terminals in 1926, Ihlen, Minn., on March 1, Troy, Mont., and Wolf Point on March 15, and Casselton, N. D. on July 1.

It was not found expedient to close any additional terminals in 1927, but on May 6, 1928, five terminals were closed, Barnesville, Minn., Redland, Minn., Devils Lake, N. D., New Rockford, N. D., and Cut Bank, Mont. The carrying out of these changes followed the enlargement of the existing engine and yard facilities at Fargo, N. D., Grand Forks, N. D., and the establishment of a crew-changing point at Blackfoot, Mont., 26 miles west of Cut Bank. On February 1, 1929, the terminal at Cass Lake, Minn., was closed, making a total of 14 engine terminals eliminated since 1921.

Table II—Freight Engines

Present Runs		Former Runs	
Between	Distance	Between	Distance
Willmar-Sioux City	225.1	Willmar-Ihlen	112.3
		Ihlen-Sioux City	112.8
St. Cloud-Minneapolis and return to St. Cloud (turn around run)	128.5	St. Cloud-Minneapolis (one way only)	64.2
St. Cloud-Fargo	166.9	Minneapolis-Melrose	97.5
		Melrose-Barnesville	109.2
Superior-Grand Forks	290.5	Superior-Cass Lake	158.5
		Cass Lake-Redland	104.9
Breckenridge-Minot	272.3	Breckenridge-New Rockford	163.5
		New Rockford-Minot	108.8
Grand Forks-Minot	207.1	Grand Forks-Devils Lake	88.7
		Devils Lake-Minot	118.4
Williston-Havre	309.2	Williston-Wolf Point	106.7
		Wolf Point-Bowdoin	102.6
		Bowdoin-Havre	99.9
Great Falls-Laurel	224.5	Great Falls-Judith Gap	120.7
		Judith Gap-Laurel	103.8
Great Falls-Butte	169.6	Great Falls-Clancy	112.3
		Clancy-Butte	57.3
Havre-Whitefish	256.2	Havre-Cut Bank	129.3
		Cut Bank-Whitefish	126.9
Great Falls-Whitefish	250.7	Great Falls-Cut Bank	123.8
		Cut Bank-Whitefish	126.9
Whitefish-Hillyard	269.2	Whitefish-Troy	134.5
		Troy-Hillyard	134.7
Hillyard-Appleyard	179.3	Hillyard-Wilson Creek	103.8
		Wilson Creek-Leavenworth	97.5

In carrying out this program no entirely new terminal was constructed, but in many cases existing small terminals were enlarged. In almost every case the terminal closed was an "away-from-home" terminal and in general the effect has been to give the men more time at home, better places to live, with improved facilities for the education of their families.

Following out the idea of increasing operating efficiency by means of long engine runs, the Great Northern has kept a careful check as to costs in each case. In many cases, increased utilization has resulted in the use of heavier power, so that the cost figures must be properly equated before any truly comparative figures can be arrived at. However, the conclusion is that the cost of maintenance per locomotive mile has not changed materially, and the useful maintenance work formerly performed by mechanics at intermediate terminals must still be done at the remaining terminals.

Operating Methods and Results

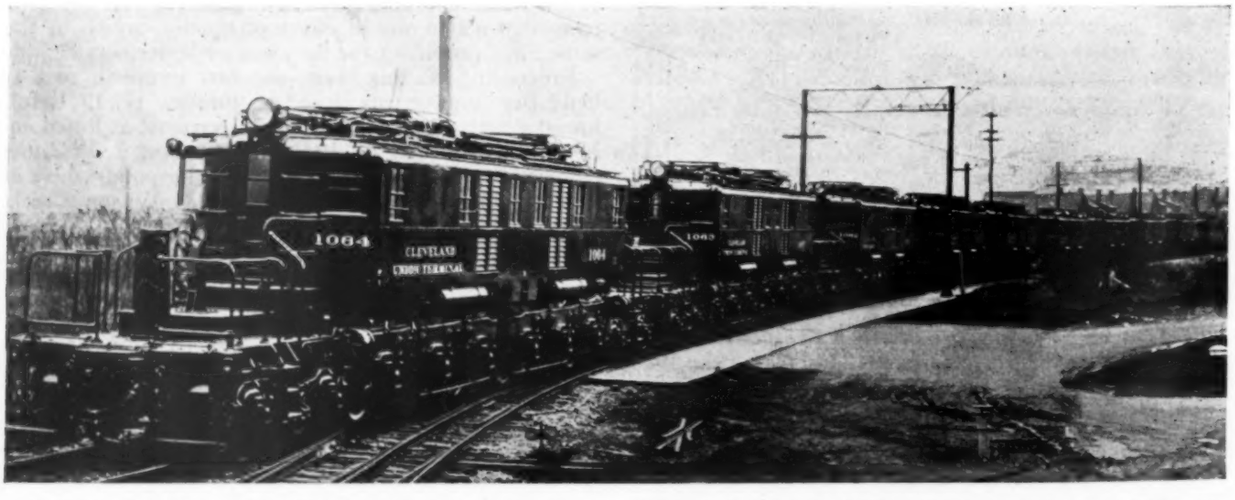
It has not been found that the extended engine run plan results in any noticeable difference in the number of miles made between shoppings. However, more tonnage is being hauled with the locomotives, with a quicker turning of the power. In other words, the engines get their mileage more quickly. The locomotive maintenance plan has not been changed. As far as possible the engines are assigned to certain shops for heavy repairs, while some of the larger enginehouses handle locomotives requiring class 5 repairs.

The relay plan of extended engine runs is used in some cases; for instance, at Troy, Mont., because of the delay which would be encountered in cleaning fires, a relay engine is held at the crew-changing station, where a hostler and fire knocker take care of the power. An engine arriving on a freight train is immediately cut off and the relay engine is coupled on. In this way, it is necessary to hold only one engine at the terminal between trains.

In the Mesabi ore district, a simple articulated engine runs from Allouez, Minn., to Kelly Lake, 115 miles, stopping at Brookston for coal and water. At Kelly Lake, the crew steps from the incoming engine on to another engine of the same type, which has been watered and coaled, and proceeds to the other end of the yard, where it is coupled on to a train which has already received the necessary air test, and returns to Allouez, with one stop at Brookston for coal and water.

While test runs of considerable length have been made to determine the practicability of extended engine runs, the G. N. has made no attempt to break any records. Rather, it has proceeded to extend engine runs on the basis of operating efficiency, and as the practicability of lengthening each run has been demonstrated in regular, day-by-day service. The plan has been developed over a period of ten years and the results, as indicated herein, have been excellent.

* * * *



A Train of 10 of the New Electric Locomotives for the Cleveland, Ohio, Terminal Electrification on the Test Track at the Erie, Pa., Works of the General Electric Company

B. R. & P. Earns 6.11 Per Cent on Stock

Rate of return increases despite heavier maintenance program—Coal traffic improves

THE Buffalo, Rochester & Pittsburgh in 1929 had net income available for dividends of $1,008,698, an increase of $150,225 over the previous year, the highest total attained since 1926. The 1929 total exceeded that of all years since federal control, except 1926 and 1923. Operating revenues in 1929 totaled $17,811,818, an increase of $845,314 over the preceding year. Operating expenses totaled $14,577,099, an increase of $728,740 over 1928. Net operating revenue totaled $3,234,718, an increase of $116,573. This increase all but disappeared, however, in an increase in tax accruals from $500,000 to $600,000. Income from car hire, however, showed an increase of $130,736, which was the largest single contributory item in the improved net income showing.

Net income was equivalent to 6.11 per cent on all stock (preferred as well as common), which compares with a rate of 5.2 per cent earned in 1928. The usual dividend payments—4 per cent on common and 6 per cent on preferred—totaled $780,000 and the profit and loss credit balance was increased by $197,249 to a total of $3,337,246. The total corporate surplus at the end of the year stood at $8,067,080—or approximately one-half the total stock, common and preferred, outstanding. Gross income showed a ratio of 1.4 to fixed charges.

The B. R. & P. greatly improved its freight service operating efficiency in 1929 when compared with 1928. Selected cumulative statistics for the first eleven months of the two years are compared in Table II. Gross ton-miles and net ton-miles increased 5.7 and 8 per cent respectively, while freight train-miles declined 1.5 per cent and freight train-hours 3.5 per cent. Car-miles per car-day increased 24.4 per cent and net tons per train rose 9.7 per cent. Net ton-miles per train-hour showed an improvement of 11.9 per cent and unserviceable freight cars declined 29.4 per cent.

The operating ratio in 1929 was 81.84, as compared with 81.62 in 1928. Operating expenses increased $728,740 during the year, due to a larger maintenance program on both rolling stock and track. The maintenance of way ratio to operating revenues in 1929 was 12.94 (12.59 in 1928); the maintenance of equipment ratio, 27.62 (26.01 in 1928); and the transportation ratio, 35.93 (37.85 in 1928). In spite of the increase in operating expenses and a heavier traffic, transportation expenses actually showed a slight decline and the transportation ratio, as shown above, fell almost 2 points.

More than half of the B. R. & P.'s tonnage is bituminous coal. Tonnage of this commodity in 1929 increased 2.3 per cent, as compared with 1928; coke rose 112 per cent; iron ore, 621 per cent; pig iron, 271 per cent; other freight, 4 per cent. The increases in total freight tonnage was 7.23 per cent. Ton-miles rose 7.95 per cent. Gross freight revenues totaled $16,287,563, an increase of 5.35 per cent over the preceding year. The average revenue per ton-mile was 0.864 cents and the average haul 159.01 miles.

Table II—Comparison of Selected Freight Operating Statistics Eleven Months

	1929	1928	Per cent of change Inc	Dec.
Mileage operated	592	592	..	..
Gross ton-miles (thousands)	3,592,649	3,398,168	5.7	
Net ton-miles (thousands)	1,858,585	1,720,842	8.0	
Freight train-miles (thousands)	1,997	2,027		1.5
Freight locomotive-miles (thousands)	3,069	3,039	1.0	
Freight car-miles (thousands)	86,649	81,639	6.1	
Freight train-hours	173,248	179,544		3.5
Car-miles per day	25.5	20.5	24.4	
Net tons per loaded car	36.1	36.1	..	..
Per cent loaded to total car miles	59.4	58.4	1.7	
Net ton-miles per car day	5.48	432	26.9	
Freight cars per train	44.4	41.3	7.5	
Gross tons per train	1,799	1,677	7.3	
Net tons per train	931	849	9.7	
Train speed, miles per train hr.	11.5	11.3	1.8	
Gross ton-miles per train-hour	20,737	18,927	9.6	
Net ton-miles per train-hour	10,728	9,585	11.9	
Lb. coal per 1,000 gross ton-miles	167	169		1.2
Loco. miles per loco. day	53.9	51.8	4.1	
Per cent freight locos. unserviceable	20.1	19.7	2.0	
Per cent freight cars unserviceable	6.5	9.2		29.4

Interest in the B. R. & P. at the present time is inseparable from the authority, recently granted by the Interstate Commerce Commission, to the Baltimore & Ohio to acquire control of the property by the purchase of 84.82 per cent of its outstanding stock from the Alleghany Corporation, offering the same price as paid to these vendors for the remainder of the stock outstanding. A noteworthy feature of the B. R. & P.'s operations is the relative importance of trackage rights (130 miles out of a total route mileage of 602). Of this 130 miles of trackage rights no less than 81 miles is over lines of the B. & O In its application for author-

Table I—Buffalo, Rochester & Pittsburgh—Revenues and Expenses

	1922	1923	1924	1925	1926	1927	1928	1929
Freight revenues	$14,366,438	$19,310,382	$13,575,578	$14,314,886	$16,515,591	$15,800,753	$15,459,926	$16,287,564
Passenger revenues	1,652,355	1,762,856	1,628,372	1,442,158	1,250,011	1,085,138	920,264	850,823
Total Oper. revenues	16,746,506	22,024,651	15,951,853	16,560,781	18,423,273	17,522,081	16,966,504	17,811,818
Maint. of way	2,391,728	3,913,515	1,713,591	2,100,406	2,257,887	2,276,992	2,137,063	2,303,690
Maint. of Equip.	6,505,106	7,079,622	4,683,447	4,527,035	5,253,615	5,649,877	4,412,392	4,918,497
Transportation Expenses	6,710,688	8,433,139	6,240,218	6,229,922	6,445,996	6,662,273	6,421,575	6,399,574
Total Oper. Expenses	16,332,659	20,175,269	13,451,122	13,690,729	14,851,592	15,485,430	13,848,359	14,577,100
Net operating revenue	413,817	1,849,382	2,500,731	2,870,052	3,571,681	2,036,651	3,118,145	3,234,719
Total Oper. Income (after taxes)	42,043	1,447,495	2,092,798	2,374,037	2,966,552	1,700,054	2,616,711	2,633,139
Non-operating income (including per diem)	1,169,300	2,116,280	1,035,432	795,538	864,668	841,008	807,412	938,622
Gross Income	1,211,343	3,563,775	3,128,230	3,169,574	3,831,220	2,541,062	3,424,123	3,571,761
Net income available for dividends	*1,191,165	1,081,499	621,883	661,596	1,328,295	1,277	858,473	1,008,698
Dividends (preferred 6; common 4 per cent)	780,000	780,000	780,000	780,000	780,000	780,000	780,000	780,000
Surplus After Dividends	*1,971,165	301,499	*158,117	*118,404	548,295	*778,723	78,473	228,698

* Deficit.

The Buffalo, Rochester & Pittsburgh

ity to acquire control of the B. R. & P., the B. & O. called attention to these trackage agreements and represented that, by closer co-operation following acquisition of control, considerable economies for both companies could be effected.

Traffic Relationships with Baltimore & Ohio

The Baltimore & Ohio also foresaw closer traffic relationships which would result in increased business for the B. R. & P. and its ability to supply a deficiency in box car equipment for the latter company. The development of the Baltimore & Ohio's proposed short line between New York and Chicago, in which a portion of the B. R. & P. would be an integral part ought also to increase the volume of traffic moving over the B. R. & P. It is likewise worth noting that the Baltimore & Ohio's short line would use the Buffalo, Rochester & Pittsburgh's principal leased line, the Allegheny & Western. Approximately one-third of the fixed charges of the B. R. & P. is represented by rental payments. To have a strong parent company directly interested on its own part in a major proportion of the lines in the use of which these charges are incurred should tend to have a strengthening effect on the subsidiary company

The granting of the application also should make possible the solution of a number of problems which the B. R. & P. has recently had to face, being forced to delay action pending a decision as to the future of the road. Among these are a need for additional freight equipment, bridge strengthening to provide for heavier power and terminal improvements at Pittsburgh.

The Buffalo, Rochester & Pittsburgh has gone through a lean period in its principal item of traffic—coal. Just how serious this contraction has been may be judged from the fact that revenue ton-miles in 1929, in spite of the decided improvement over 1928, nevertheless were lower than the ton-mileage in 1923 and in every one of the years 1916 to 1920 inclusive and were exceeded as long ago even as 1913. Yet in spite of this unfavorable traffic condition the road has been able to pay its dividends consistently, to provide a high quality of service to its patrons and to hold its property to a high physical standard. If it has been able to do so well in spite of unfavorable conditions, then the revival of coal traffic, together with the benefits from added traffic and operating economies which are expected from closer affiliation with the Baltimore & Ohio, should bring to it in coming years even more satisfactory earnings and financial strength.

Illuminated Tail Signs

ELECTRICALLY-LIGHTED tail signs for use on more important trains have been placed on the market by the Crystal Manufacturing Company, Chicago, Ill. The distinctive features of the signs are the brilliant colors, effective light distribution, strong light-weight construction and accessibility. The signs are effective both in daylight and darkness. The one illustrated, used by the Burlington, measures 23 in. by 27 in. and the color scheme is silver outline and letters on a black background with a red and white border. Two pieces of heavy glass comprise the front

This Sign and Another Reading "Burlington Route" are Used on One of the C. B. & Q. Trains

piece which is taped all around and bound with a metal binder. The front pieces are easily interchanged without taking the case off the car. Shatter-proof glass can be provided, if desired. Fifteen-watt lamps are used for illumination. The case is made of 26-gage galvanized sheet steel reinforced by angular flanges. The lamps are mounted on the flanges and the flanges form reflectors for the light. A length of two-conductor, super-service reinforced cord is provided to connect the lights with the train line.

THE LONGEST RAILWAY TUNNEL in the Orient, and the seventh longest in the world, was scheduled for completion on the Shimizu Railway in Japan early this year. The tunnel, six miles long, runs from Gumma to Niigata and cost nearly $20,000,000 to build. The final blast was exploded electrically by Dr. Yoku Egi, Minister of Railways, from his office in Tokyo, 100 miles away.

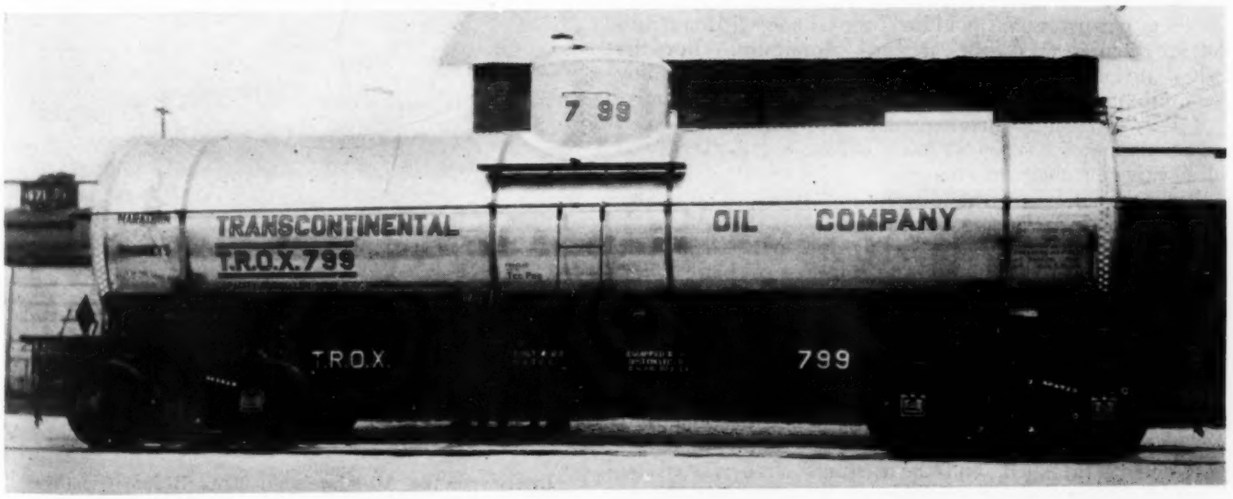
An 8,000-Gal. All-Aluminum Tank Car of Riveted Construction Built by the Standard Tank Car Company

Aluminum in Tank-Car Construction

Its neutral chemical characteristics dictate its use in cars transporting various chemicals and food products

IN the final process in the rectification of synthetic acetic acid, aluminum equipment is used to avoid discoloration and redistillation. For the same reason it is advantageous to ship and store the acid in drums fabricated from aluminum. These containers have been employed successfully since the inception of the synthetic process for the manufacture of acetic acid. Recently there has been a demand for a more economical means of transporting large quantities of the acid. To meet this demand, a tank car with an all-aluminum shell has been developed.

While the all-aluminum tank car was built first to facilitate the movement of large shipments of acetic acid, its use is by no means limited to this chemical alone. Many chemicals and food products react with steel and must be shipped either in small containers or in rubber-, glass-, tin- or lead-lined steel tank cars. Among these products are transparent lacquers, glycer-



A Steel Tank Car Covered with Aluminum Foil To Increase the Heat Reflectivity of the Outer Surface of the Car

Alum'num Castings Riveted to the Dome of an All-Aluminum Tank Car

ine, formaldehyde, fuming nitric acid, sulphuric acid, milk and turpentine. These are but a few of the products which can be shipped in all-aluminum tank cars without becoming discolored or contaminated.

First Aluminum Tank of Welded Construction

The first all-aluminum tank car was of welded construction. It has a rated capacity of 8,000 gal. The underframe and trucks are of steel and according to the standard tank-car requirements of the American Railway Association.

The car was placed in operation in August, 1928, and operated by the Niacet Chemical Company on an experimental permit from the Interstate Commerce Commission. For the first 2,000 hours of operation, it was equipped with a recording seismograph, or impact register. During this time, a total of 3,500 shocks were registered, 900 of which were severe. No structural weaknesses occurred, nor have any developed since. The car has travelled over 22,000 miles.

The entire tank, including the dome, fittings and heating coils was fabricated of aluminum. For the shell proper, 3S alloy, an aluminum-manganese alloy containing 1.25 per cent manganese was used because of its exceptional forming qualities. The heating coil was made of seamless tubing of the same alloy, and the valve mechanism constructed of 17S alloy bar, an aluminum alloy of the duralumin type. The dome cover and outlet fittings were cast from No. 43 alloy, an aluminum-silicon alloy containing 5 per cent silicon.

Because of the limitation in the size of plate available at the time this car was constructed, 16 plates were required for the shell and two for the dome. The bottom plates are ⅝ in. thick and the plates for the upper two-thirds of the shell, ½ in. thick. The tank ends were beaten and spun from ½-inch plate. The various sections of the main shell and dome were joined by means of butt welds. The dome was fillet welded to the shell, and the castings were riveted on.

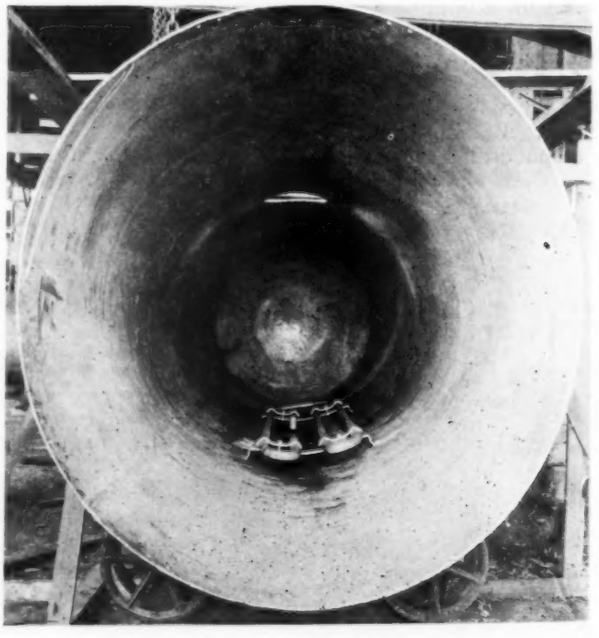
The design and construction of the welded tank car is such that there is a factor of safety of 3½ at the weakest point when tested under a pressure of 60 lb. per sq. in.

Since the completion of this first all-aluminum tank car, a satisfactory means has been devised for producing and driving strong aluminum alloy rivets, ranging in diameter from ¾ in to ⅞ in. As a result of this development, all subsequent tank cars have been of riveted construction. In riveting the joints of these cars, the rivet holes are punched and reamed 1/32 in. over size. The seams are double riveted with ¾-in. hot-driven rivets on 2¾-in. centers and with a 2-in. back pitch. This gives the joints an efficiency of 71 per cent of the strength of the thinnest plate.

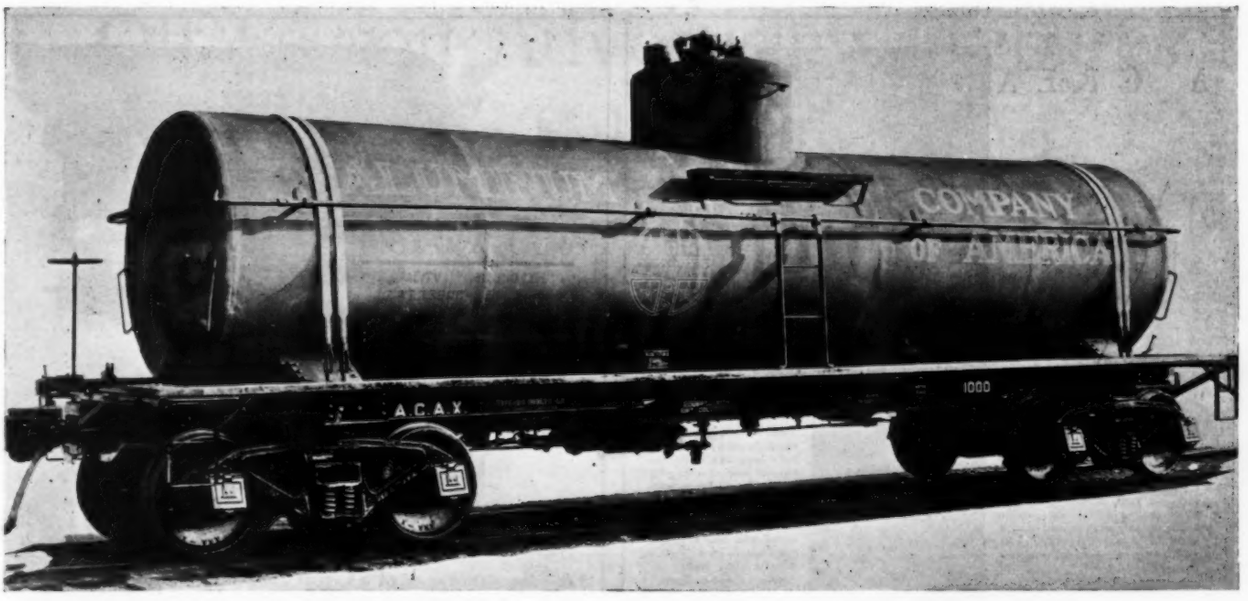
One of the main difficulties encountered in building the welded tank car was the large number of plates required to form the shell, a total of 18 being necessary, 14 for the body, two for the heads and two for the dome. But before the first riveted car was built, methods were developed which made it possible to produce plates in sizes up to ½ in. by 82 in. x 177¾ in. This reduced the number required for an 8,000-gallon tank car to 11, 8 for the body, 2 for the heads and one for the dome. Recently, however, the demand for aluminum tank cars has increased to such an extent that the Aluminum Company of America has developed rolling practice which makes possible the construction of an 8,000-gallon tank car with three body plates, two head plates and one dome plate, the same number now in use in building tank cars of steel.

The alloys used in the present day all-aluminum tank cars are the same as were employed on the original experimental car. The underframe and trucks are of steel. The cars are designed for a working pressure of 25 to 30 lb. per sq. in. and a bursting pressure of 180 lb. per sq. in. A test pressure of 35 lb. per sq. in. usually is employed although some of the earlier riveted cars were tested under a pressure of 60 lb. per sq. in. with complete satisfaction.

An 8,000-gallon all-aluminum tank car generally costs from two to two and one-half times as much as



Interior of the All-Aluminum Tank Before Closing—The Shell and Heating Coils Are of Aluminum-Manganese Alloy



An 8,000-Gal. Experimental Aluminum Tank Car of Welded Construction Which Was Placed in Service in August, 1928

a steel tank car of the same size. Where certain chemicals or food products are transported in steel cars it is necessary to use a rubber, glass, tin or lead lining. A rubber lining, for example, costs about three-fourths the price of a steel tank car. The resulting price of the steel tank car is, therefore, approximately four-fifths that of the aluminum tank car. The lining is not permanent and when it has been replaced once the higher initial cost of the aluminum car has been justified.

The chemical characteristics of aluminum at present constitute the controlling factor in determining its use for tank cars although there is a material saving in dead weight which is advantageous. An 8,000-gallon tank car with shell fabricated of aluminum weighs approximately 8,300 lb. less than the same capacity tank car having a steel shell.

The all-aluminum car requires no painting to preserve it as aluminum is resistant to atmospheric corrosion. The natural finish of the metal not only adds to the beauty of the car but is a decided benefit when volatile substances are being transported. Aluminum has a high degree of reflectivity for light and heat, and as a result there is a uniformly lower temperature within the car.

The oil companies have appreciated the use of aluminum for this purpose; and while there is not so much need of an all-aluminum car, there is need for a better heat reflecting outer surface than the standard steel car possesses. For this reason, aluminum paint has been used extensively. Recently, however, the outer surface of steel tank cars has been covered with aluminum foil because of its higher degree of reflectivity.

* * * *

The "Alouette" at Laconia, N. H., on the Boston-Montreal Line of the Boston & Maine and Canadian Pacific

TO EVERYWHERE IN CANADA

A GREAT RAILWAY

first IN ENTERPRISE

FIRST—IN SIZE

STRONG words—but true! "First in size," because Canadian National is the largest railway system in America, with over 23,000 miles of track, over 108,000 employees, a chain of magnificent hotels, steamships on two oceans, vacation resorts, hunting and fishing camps, a telegraph system, radio stations, an express service.

"First in enterprise"—because Canadian National is alive with the urge to new achievement. It has led the way in new luxury and new efficiency of equipment—first with individual radio reception on its trains first to accomplish telephone connection from a moving train—first in oil-electric locomotion—first in Canada with single room sleeping cars.

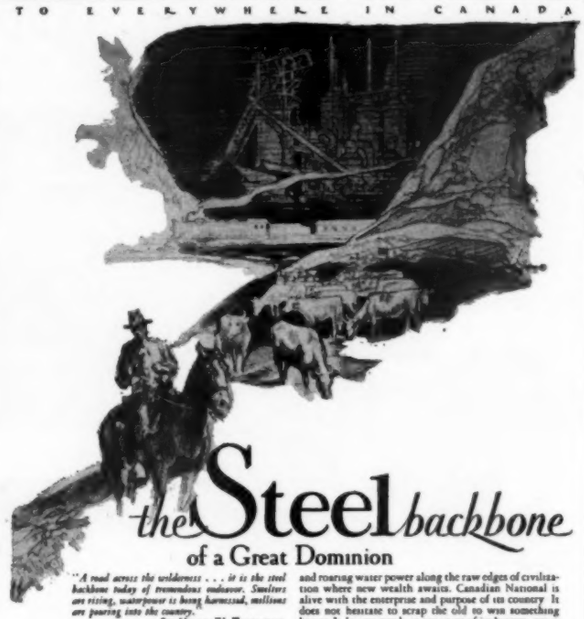
When better equipment is found, the old is replaced. Not very long ago Canadian National scrapped seven solid miles of locomotives to make room for better ones. Another time it put a whole town on flat cars and built it again twenty miles away to make a better junction point. Canadian National is never finished—because it is always growing

Canadian National is your open door and your guide to Canada. Its offices in important American cities are ready to supply complete information. Its services take you direct from American centres to everywhere in Canada

CANADIAN NATIONAL

THE LARGEST RAILWAY SYSTEM IN AMERICA

TO EVERYWHERE IN CANADA



the Steel backbone of a Great Dominion

"A road across the wilderness . . . it is the steel backbone today of tremendous endeavor. Smelters are rising, waterpower is being harnessed, millions are pouring into the country."

SIR HENRY W. THORNTON,
CHAIRMAN AND PRESIDENT,
CANADIAN NATIONAL RAILWAYS.

ACROSS Canada stretches the largest railway in America—the steel backbone, the nerve and sinew, of a great Dominion. With over 23,000 miles of tracks, a chain of hotels, steamships, a telegraph system, radio stations, an express service, it joins the Atlantic to the Pacific and the Great Lakes to the shores of Hudson Bay. It links the spreading cities of older Canada to golden prairies, to rugged Rockies, to mining camp and smelter, and roaring water power along the raw edges of civilization where new wealth awaits. Canadian National is alive with the enterprise and purpose of its country It does not hesitate to scrap the old to win something better. It has scrapped, at one stage of its history, seven solid miles of locomotives to make room for new and more powerful ones. It has put a whole town on flat cars and rebuilt it twenty miles away to make a better terminus. It has permitted nothing to block the unceasing urge to new achievement.

Canadian National is your open door to Canada. It gives you the luxury of its hotels and vacation resorts, takes you where the game fish leap, meets every need of travel or accommodation.

CANADIAN NATIONAL

THE LARGEST RAILWAY SYSTEM IN AMERICA

TO EVERYWHERE IN CANADA

AS IMPORTANT AS THE "President"

"A messenger boy is as important in his sphere as I am in mine. The minute a single man slacks on the job a bolt begins to rattle."

SIR HENRY W. THORNTON,
CHAIRMAN AND PRESIDENT,
CANADIAN NATIONAL RAILWAYS

IT is not magnitude alone which makes Canadian National a truly great railway system. Neither is it perfection of equipment. It is something more rare—*character*. There are 108,000 men in the army of Canadian National employees and they possess one common characteristic—enthusiasm.

Among these 108,000 men one thought has been preached and practised and preached again—a messenger boy is as important in his work as the president in his every man must do his job or the whole will falter

An intangible thing, *esprit de corps*—but a mightier force than all the mammoth locomotives which take the Rockies in their stride It has made Canadian National a great railway and a great institution, alive with enterprise and purpose, like the virile young nation of which today it is the nerve and sinew

The Canadian National Railways System has over 23,000 miles of track, a chain of hotels, vacation resorts, steamships, a telegraph system, radio stations, an express service It has the mightiest locomotives and the most luxurious equipment that men can build or money can buy. It spans a continent from east to west and links the Great Lakes to the shore of Hudson Bay The largest railway system in America

Radio reception on Canadian National trains today—telephone connection from moving trains to home and office perhaps tomorrow The last word in steam locomotion today—new marvels of oil-electric locomotion on the horizon. Maximums of efficiency and luxury today—better, finer, greater things tomorrow That is the product of enthusiasm. It is the character of a railway system in which messenger boy and president have the same unceasing urge to greater achievement

CANADIAN NATIONAL

THE LARGEST RAILWAY SYSTEM IN AMERICA

TO EVERYWHERE IN CANADA

America's LARGEST RAILWAY *is ever expanding*

"A railroad is never finished. It must be self-competitive, fighting for new life, new business, new progress, new knowledge and vision."

SIR HENRY W. THORNTON
CHAIRMAN AND PRESIDENT,
CANADIAN NATIONAL RAILWAYS.

THE largest railway system on this continent is Canadian National Railways. It is the very nerve and blood and sinew of a great Dominion. It is never finished because it is always growing. It is alive with enterprise and purpose, pushing forward always to new achievement, like the country of which it is a part.

Its 23,000 miles of tracks extend from great cities of the United States to everywhere in Canada, join Atlantic to Pacific and reach to the shores of Hudson Bay.

Canadian National is not only the largest railway in America—it serves every phase of travel and communication. It operates magnificent hotels, vacation resorts, hunting and fishing camps, steamships on two oceans, a telegraph system, radio stations, and express service. It has more than 100,000 employees.

For five years passengers on Canadian National crack trains have enjoyed radio service. Tomorrow they may have telephone connection on moving trains with home and office already it has been accomplished.

Tomorrow the shining steel of the Canadian National network will give new life and find new wealth across far country which today seems only a wilderness.

Maximum of luxury and efficiency are the standard throughout the Canadian National system. Tomorrow these maximums will be superseded by new achievements—finer, better, greater.

Truly it is said—America's largest railway system is ever expanding.

CANADIAN NATIONAL

THE LARGEST RAILWAY SYSTEM IN AMERICA

Off-Season Advertising Prepares Way for Sales Campaign

Canadian National's institutional program for winter months fortifies and prepares way for direct sales message in tourist season

By C. F. Goldthwaite

Manager, Advertising Bureau, Canadian National

NOT so many years ago the family which spent a few months in Europe each year at once established its position in the social register, but today advertising has taught the American that a European tour, a Caribbean cruise or a trip to the Pacific Coast, plus, perhaps, a voyage to Hawaii or Alaska, is within the reach of all. Advertising has also taught the great traveling American public that just to the north of them lies a foreign country—foreign only in the literal sense of the word—offering them a playground that is second to none in the world. Advertising has told them of its mountains capped with snow, its glaciers, gorges, trackless forests, magnificent rivers and waterfalls, its lakes and above all its comfort-giving resorts at lake and seashore, in forests lands or mountains. Advertising has told them that Canada, just to the north, has a climate that is a delight to the vacationist in summer and winter, that the sportsman can enjoy hunting and fishing and other sports no longer available on a large scale in his own country, that here is a land that combines romantic and historical attractions and modern enterprise as no other spot so close at hand can do.

This message has met with such reception that thousands of "travel-minded" people are visiting some part of Canada each year. The secret of good advertising, however, is "everlastingly keeping at it." Canada's summer tourist season is relatively short, limited largely in this country as it is in the United States by the closing and opening of the schools. True, thousands of Americans are coming to Canada to enjoy the winter sports that are offered here as nowhere else except in Switzerland, but after all the summer vacation is the main season which produces tourist business.

Tourist Advertising Effective Only in Summer

All these things have been carefully considered by the Canadian National in its advertising to the American public. It is known that certain kinds of vacations appeal to men and others to women; it is realized that certain trips are planned in winter and hence must be advertised far in advance of the actual tourist season; the person of wealth is considered from one angle and the clerk or stenographer with a comparatively limited amount of vacation money from another; but they are all considered in due time. Even at its best, however, effective advertising of vacations in Canada must be confined to a relatively short period of the year. With this in mind, the Canadian National has developed its United States advertising along intensive lines, combining general advertising in a selected group of national magazines, class and sportsmen's publications; with localized advertising in newspapers from coast to coast, this last mentioned advertising being adapted largely to the travel inclinations, or the trend of travel, from the territories in which the advertising is being done.

At best, however, this leaves a gap between tourist campaigns in which a fickle public might forget about Canada and the Canadian National. In other words, the regular tourist campaigns of the Canadian National do *not* keep everlastingly at it, and in order that this gap might be bridged, several years ago, the idea of an "off-season" campaign was conceived and developed—a campaign which would have as its prime object to make the potential American tourist "Canada-Conscious" and to impress upon him the thought that Canada and the Canadian National Railways are synonymous.

"To Everywhere in Canada" is the general motif of this advertising and the theme is "The Largest Railway System in America."

The word "largest" has a great appeal to the Anglo-Saxon on this side of the Western Ocean—the largest bank account, the largest house in the neighborhood, the biggest car, and so on, even to traveling on the largest railroad on the continent, which naturally must be one of the best equipped. So the Canadian National's off-season advertising tells next year's tourist, during his leisure winter reading, that Canada has the largest railroad on the Continent—over 23,000 miles of main lines—and also that it takes him everywhere in Canada, from the Atlantic to the Pacific, from Montreal to Vancouver without change, and from cities of the central states to the shores of Hudson Bay.

Various Phases of Institutional Appeal

This advertising goes farther than this, however. It tells him something of the achievements of the railway. It tells him that it operates modern comfort-providing, radio-equipped trains and the last word in motive power, a chain of hotels, a commercial telegraph system from coast to coast, an express company from Atlantic to Pacific, radio broadcasting stations and palatial steamers on two oceans. It might go farther than that and say you can board a Canadian National Steamer at Skagway, Alaska, and journey to Vancouver, thence by rail to Halifax and again embark for British Guiana in South America, without traveling other than on a Canadian National ticket. But this copy is primarily to sell Canada and to let the potential tourist know

that Canadian National is "the very nerve and blood and sinew of this great Dominion."

It would not be amiss at this point to call attention to the reproductions shown herewith of some of this advertising copy and to the various phases of the railway as an institution which are dealt with. "First in Enterprise and First in Size" is the theme of one. Another of these advertisements bears the title "The Steel Backbone of a Great Dominion," a second, "America's Largest Railway is Ever Expanding," stating that "maximum of luxury and efficiency are the standard throughout the Canadian National System" and that "tomorrow these maximums will be superseded by new achievements—finer, better, greater."

A third advertisement pictures a locomotive engineman thrusting his oil can into the driving mechanism of a huge locomotive and the caption is "As Important as the President." This copy leads with a quotation from President Sir Henry Thornton of the Canadian National Railways, which reads: "A messenger boy is as important in his sphere as I am in mine. The minute a single man slacks on the job a bolt begins to rattle." This advertisement has as its motif the stressing of the importance of the human element in making the railroad everything that the tourist desires.

This advertising appears in magazines—monthly and weekly—during the months of October, November, December and January. Tourist advertising makes its first appearance in February issues of magazines and so, preparatory to the tourist advertising, two pieces of this copy tell the stories "To Everywhere in Canada" and "To Canada, America's Playground, via Canadian National."

All these efforts are educational—institutional if you prefer; they have one objective, to sell Canada, the vacation country, and the thought that the Canadian National must always be associated with travel in Canada because it is "the nerve and sinew of this great Dominion." This campaign in the "off-season" prepares the reader for the direct sales appeal of the "in-season" campaign, strengthening its effectiveness.

THE CHICAGO, ROCK ISLAND & PACIFIC has paid a total of $3,697,885 in pensions to retired employees since its pension system was established in 1910. During 1929, 180 employees were retired, and over $500,000 was paid to retired employees during the year.

* * *

Card Room on the "Banner Blue Limited" of the Wabash

Southern Pacific Installs Ticket Printing Machine

THE passenger traffic department of the Southern Pacific has installed an Ohmer automatic ticket printing machine in the Sacramento station as an experiment to determine the merits of the machine and to ascertain if its adoption for permanent use will be an improvement over present methods of ticket selling. The instrument, which is entirely automatic, not only prints, dates and numbers the tickets, but does its own accounting as well. Local one-way and round-trip tickets only are handled by the machine.

The machine has a capacity of one hundred destinations; in other words, it will print tickets from one station to one hundred other stations. Dies are provided for each destination. To issue a ticket, an indicator is moved to the destination desired, a handle pulled down, and, without further effort on the part of the salesman, the ticket is printed, dated, cut and thrown out of the machine ready for delivery. When the indicator is placed in position for the destination desired, and the handle moved, it automatically lifts the die for that particular point and places it in position. The operation of the machine is as quick or quicker than taking a ticket from the ticket case, stamping it and handing it to the passenger. The stock on which the tickets are printed comes in large rolls and is fed through the machine automatically.

As the tickets are printed, two paper tapes are also printed, on which is shown the number of the ticket, the number of the agency to which the ticket is sold, and the fare. One of these tapes is for the ticket seller, who tears off the portion covering his shift. The other tape is locked in the machine, and is for the accounting department.

When a man goes on duty, he prints what is called a control ticket, on which is shown his identification, the time he starts to work and his name. His identification number is printed on each ticket issued by him. He is required to account for all tickets, including the first and last control tickets. If a ticket is printed in error, deduction is made on the tape and the ticket cancelled. The value of the tickets sold is obtained by totaling, on an adding machine, the amounts shown on the tape he tears off at the end of his shift. A small numbering machine is provided for each destination so that, at the end of the month, the total number of tickets sold to each destination is available. The impression for the previous month shows the closing number for that month for each destination which, deducted from the impression taken at the end of the current month, gives the total number issued during the month.

Advantages claimed for the machine are a reduction in the amount of clerical work, a smaller number of regular tickets printed, less counting of stock by traveling auditors, and a saving of time in securing ticket stock, both from printers and from the stock rooms.

EFFECTIVE JANUARY 1, additional reductions have been made in the freight rates of the Rhodesian railways. By lowering the amount of their reserve provision from £350,000 to £150,000 the railways were able to grant rate reductions totaling £198,500 annually, according to reports from the Department of Commerce. This reduction is in addition to one totaling approximately £128,000, which went into effect on October 1, 1929. The most important revisions are in rates on machinery and coal. Long distance passenger fares have also been reduced to the level prevailing on the South African Railways.

Samuel M. Felton Dies From Lingering Illness

Career started from the position of rodman and included continuous accomplishment in railroad work

SAMUEL Morse Felton, chairman of the board of the Chicago Great Western, died on the evening of March 11 in the Passavant Hospital, Chicago, where he had been a patient since November 19, following a heart attack accompanied by a slight stroke of paralysis. His death brings to an end a career of over 62 years in railroad service that was marked by many worthy accomplishments. In addition, his long experience as a railroad leader was recognized by the government during the World War when he was appointed director general of military railways, and his constructive work in this capacity was rewarded by a distinguished service medal, the first ever bestowed upon a civilian.

Mr. Felton's long railway career was one of the widest experience and was stimulated, perhaps, by the record of his father who preceded him as a railroad man. Samuel M. Felton, Sr., was superintendent of the Fitchburg in 1843, and was later president of the Philadelphia, Wilmington & Baltimore. During the Civil War, the elder Mr. Felton arranged for the secret passage of President Lincoln from Harrisburg, Pa., to Washington through Baltimore, where a plot had been arranged for the wrecking of the train and the assassination of Lincoln.

Mr. Felton, Jr., was born at Philadelphia, Pa., on February 3, 1853, and entered railway service in August, 1868, as a rodman on the Chester Creek railroad. Later he was promoted to leveler, to assistant engineer and to engineer in charge of surveys, and in 1873 was appointed chief engineer of the Chester & Delaware. He entered the operating department in August, 1874, when, at the age of 21, he was appointed general superintendent of the Pittsburgh, Cincinnati & St. Louis, now a part of the Pennsylvania. In September, 1881, his jurisdiction was extended over the Little Miami and the Cincinnati & Muskingum Valley railroads. He was appointed general manager of the New York & New England in January, 1882, and was promoted to assistant to the president in February, 1884. In November, 1885, he went to the New York, Lake Erie & Western as vice-president in charge of the traffic department, resigning in November, 1890, to become president of the East Tennessee, Virginia & Georgia.

This change marked the beginning of his career as a "doctor of sick railroads." He was elected president of the Cincinnati, New Orleans & Texas Pacific, now a part of the Southern, in November, 1890, and was appointed receiver of the road in March, 1893. In November, 1895, he was also elected president of the Alabama Great Southern. He was also receiver of the Columbus, Sandusky & Hocking, from June, 1897, to September, 1899. Mr. Felton's close association with the late E. H. Harriman led, in September, 1899, to his election as president of the Chicago & Alton, with which road he remained until December, 1907. At that time he was elected president of the Mexican Central, remaining in that position until April, 1909, when he was elected chairman of the board of directors of the Tennessee Central.

Samuel M. Felton

Mr. Felton became connected with the Chicago Great Western in August, 1909, when he was elected president and held that position continuously until November 2, 1925, when he was elected chairman of the board of directors. He also engaged in many other interesting activities. From September, 1912, to August, 1914, he was receiver of the Pere Marquette, being also president of the corporation from January, 1913, to June, 1914. He was elected president of the Western Railroad Association in 1913, and held that position until his death. In addition, at the time of his death he was chairman of the Western Association of Railway Executives, chairman of the Chicago Presidents' Conference, a member of the executive committee of the Association of Railway Executives and a member and former chairman of the Western Presidents' Conference Committee on Public Relations.

Mr. Felton's military service which brought him the distinguished service medal, began in June, 1916, when he was selected, on the recommendation of a committee representing five national engineering societies, to take charge of the work of assembling men and materials for possible railway operations in connection with the ex-

pedition into Mexico, including the problem of taking over and operating the Mexican railroads, if necessary. In this capacity he served as consulting engineer and railway advisor to General Black, chief of engineers of the United States Army. After the entrance of the United States into the World War, Mr. Felton sent a railway commission to Europe to investigate transportation conditions there, while he took charge of the organization of the first nine railway regiments, the recruiting of which was begun within a month after the declaration of war. When it became apparent that a separate organization must be created within the engineering department to handle the transportation problem, the office of director-general of military railways was established in July, 1917, and Mr. Felton was appointed to that position by the secretary of war. He was then involved not only in organizing, equipping and training railway troops for the construction, maintenance and operation of standard and narrow gage roads necessary for the supply of the armies in France, but also in the purchasing, inspection and shipment of the immense quantities of railway materials and equipment necessary for the development of adequate port facilities, the construction of new lines and their operation. Mr. Felton was so successful in the administration of this work that, while he refused a commission in the army, he received in addition to the distinguished service medal of the United States, the honor of rank as a commander in the Legion of Honor of France.

From May, 1918, to February 15, 1919, Mr. Felton served as vice-chairman of the Port and Harbor Facilities Commission of the United States Shipping Board, but he had expressed the desire to return to the active administration of the Chicago Great Western and he resumed his duties as president in January, 1919. He did not then sever his connection with the Shipping Board, however, but served as acting chairman of the Port and Harbor Facilities Commission from January 11, 1919, to March 1, 1920.

The election of Mr. Felton as chairman of the board of directors of the Chicago Great Western, with his consequent withdrawal from active management of the road, was the result of his earnest wish to be relieved of his pressing responsibilities as president of this company so that he might have more leisure and be able to devote more time to active participation in the affairs of the several associations of railways. He took over the management of the Great Western in August, 1909, when a reorganization terminated the one-year receivership of the property. Evidence of the manner in which he built up its traffic and kept it abreast of its competitors is shown by the fact that the ton-miles of revenue freight handled on the Great Western increased from 1,072,279,632 in 1909, to 2,093,964,819 in 1928. Gross earnings were likewise increased from $10,955,519 in 1909 to $25,825,337 in 1929.

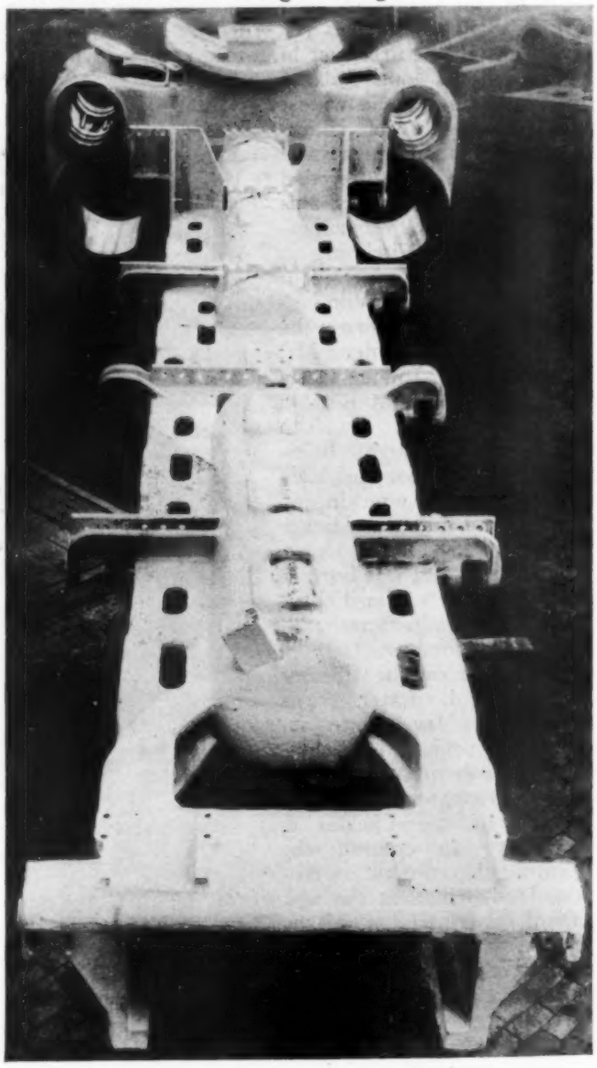
Operating economies were introduced in all departments. For example, the cost of maintaining freight locomotives per locomotive mile was reduced from 34.78 cents in 1923, to 25.74 cents in 1928, or 25.99 per cent. A fuel saving campaign which the Great Western undertook aggressively, resulted in the reduction of the pounds of coal consumed per 1,000 gross ton miles from 169.2 in 1923 to 135.1 in 1928. Charges to loss and damage to freight were 38.14 per cent less in 1928 than in 1923. Operating efficiency improved from year to year. The average movement per car per day in 1928 was 45, an increase of 87.5 per cent over 1920. The railway operating income in 1928 was $4,364,400, while in 1924 it was $3,538,480, an increase over 1923.

Main Reservoirs in Engine Bed Casting

THE photograph illustrates one of the engine bed castings recently purchased by the Union Pacific from the General Steel Castings Corporation for application to the 2-10-2 type, 5000-class locomotives.

This bed casting, which includes the cylinders, also includes another innovation. The main air reservoirs are cast as a part of the cross-tie system which joins the two side or frame members of the bed casting, thus replacing the usual steel-plate air drums carried under the running board. The casting illustrated weighs 52,550 lb. and is 36 ft. 7 in. long.

A similar engine bed casting will be used on the new 4-12-2 type, 9000-class locomotives, except that it will include the three cylinders and three valve chambers, cast integrally, and will also include the rear extension or cradle, resulting in a casting having an overall length of 60 ft. 4¼ in., and the total finished weight will be 82,000 lb. To secure a casting of this size, finished, the foundry will be required to pour over 100,000 lb. of steel in the rough casting.



The Bed Casting for Union Pacific 2-10-2 Type Locomotives Contains the Main Reservoirs

Communications and Books

Ticketing Arrangements for Southern Travel Criticized

To the Editor: New York.

In the interests of a more efficient method of ticketing passengers, I think it would be appropriate to publish the following in your magazine, where it may be noted by interested passenger officials.

In buying coupon, or inter-line, tickets from New York to points in the south, and similarly in buying one-way northbound tickets, the railroads issue a form of transportation bearing at the top, in heavy-type capitals, "Good for One Continuous Passage." It would hardly seem probable to the average passenger that such a regulation was intended to be violated, but it appears that this phrase is utterly without meaning. One may, for instance, stop off, not only at the junction points between connecting lines, but at intermediate points on individual roads enroute, merely by notifying the conductor to this effect. This fact, however, may be learned only by specifically asking if such stop-overs are permissible. It developed that many passengers carrying tickets of this sort would have liked to break their journey at intermediate points, or perhaps for the purpose of spending a night at a hotel, rather than on a sleeping car, but the fact that the ticket explicitly forbade them to do this, led them to the quite natural conclusion that they could not stop off.

There seems to be no logical reason why stop-over should not be permitted, because it is obviously to the advantage of the railroads to make rail travel as easy and convenient as possible and to avoid all regulations which savor upon needless red tape. The phrase "Good for One Continuous Passage" ought, therefore, to be eliminated from tickets of this sort.

The next feature in this ticket arrangement is the fact that tickets are punched to indicate the final day upon which the journey must be completed. It is, of course, wholly possible that this regulation may be disregarded by conductors, just as is that about the "continuous journey," although I did not inquire into this phase of it. That, however, is beside the point, because on a straight one-way ticket at regular fare there is no reason in the world why any limit should be put on the ticket. The railroads have received their money for the transportation of passengers and it is nothing to the railroad company if this is manipulated or passed through a dozen different hands. The fact remains that they have received their proper revenue for it and it should be a negotiable instrument, good for the person presenting it to use any time, at his discretion. As in the former paragraph, the point involved here is the matter of serving the convenience of the railroad customer, rather than serving the convenience of the carrier.

There is a third matter, which is admittedly open to debate, as distinguished from the points above mentioned. This deals with the matter of round-trip tickets to the south. It appears to be the case that minor reductions on round-trip tickets averaging about 10 per cent, are made if the journey is over the same route going and returning. To begin with, such a rate reduction is merely a present which the railroads are making to the passengers, because a 10 per cent reduction never served to stimulate travel to Florida, and conversely, no passengers would be deterred from making the trip merely because they did not have this slight rate cut offered them by the railroads.

That, however, is the railroads' business. If they want to give away their revenues, far be it from those who purchase railroad transportation to object. The point in question is the inelasticity of the round-trip tickets to the south which are offered. It stands to reason that there are many passengers who seek a slight deviation from the straight journey. These possibilities are ignored by the railroads. There is no need to discuss the whys and wherefores. The plain fact remains that railroad ticketing arrangements are not sufficiently elastic to permit passengers the optional routes which they might appreciate, and in consequence, after one or two rail trips over the routes which the railroads force them to use on a ticket reading "Good for One Continuous Passage" they become somewhat disgusted and decide to go south the next time by motor, or by bus, or by water.

I have had an excellent opportunity recently to note the lack of business moving on southern railroads this winter, and to observe the tremendous volume of motor traffic which is going south.

These thoughts are not offered in any captious manner, but merely because the newspaper man of an inquiring mind finds out what it is about railroad methods to which passengers take exception, and if the railroads find such observations of any value, it is part of the pleasure of any one interested in the railroads' welfare to offer such comments.

Franklin Snow.

Conductors' Attitude Toward Hand Brakes

Los Angeles, Cal.

To the Editor:

The following resolution, pertaining to the adoption by the railroads of the country of a more efficient type of hand brake on freight cars and to the action previously taken at the last conventions of the Order of Railway Conductors and The Brotherhood of Railway Trainmen and at the last meetings of the Eastern, Southeastern and Western Associations of General Chairmen of these organizations on this subject, was adopted by Mission Division 470, Order of Railway Conductors located at Los Angeles at its regular meeting held March 1, 1930, and is submitted to you for your information and what other use you deem advisable.

G. W. Taylor,
Secretary, Mission Division 470, Order of Railway Conductors.

[The resolution adopted by Division 470 is printed in full below—Editor.]

WHEREAS, Representative members of the Order of Railway Conductors, who realized the hazard involved in the operation of inefficient hand brakes, especially such hand brakes as required the use of a club to set and release, caused to be approved by the thirty-ninth session of the Grand Division of the Order of Railway Conductors, a certain resolution urging the adoption by all railways of safe and efficient hand brakes, and

WHEREAS, The Brotherhood of Railroad Trainmen, actuated by the same high motives, adopted a similar resolution at its fifth triennial convention, and

WHEREAS, The Associations of General Chairmen of both these organizations, representing conductors, train and yardmen in the Eastern, Southeastern and Western Associations, on the twelfth day of July, 1929, adopted a resolution approving and confirming the said actions of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen and pledged their united support and untiring effort to that end, and

WHEREAS, The jurisdiction of these three associations comprises the entire United States and the Dominion of Canada, and the resolutions adopted by these bodies were impartial, and made no mention of any one make of brake, thereby leaving the field entirely open to the best and latest hand brake to be had, and

WHEREAS, Claim has later been made that such resolutions specifically mentioned a hand brake by its trade name as being the choice of these bodies to the exclusion of all other brakes, and

WHEREAS, Such claim, and the apparent attempt to coerce responsible railroad officers into the adoption of that specific make of hand brake as standard on their respective railroads to the exclusion of all other brakes, has been generally harmful to the movement for the early adoption of safe and efficient hand brakes, and is also an absolute and gross misrepresentation of the facts, therefore be it

RESOLVED, That this Division of the Order of Railway Conductors, hereby expresses its emphatic disapproval of such misrepresentation as that which appeared in the January issue of the "Railroad Trainman" under the caption "Safe and Efficient Hand Brakes," and also disapproves the intimidating aspect of the entire article, and favors an *open field* for *safe and efficient hand brakes* that can be set and released with one hand without the use of a club, and be it further

RESOLVED, That one copy of this resolution be mailed to President

Curtis of the Order of Railway Conductors, one copy to President Whitney of the Brotherhood of Railroad Trainmen, and one copy to the *Railway Age*, in order that the fair and impartial position of these two organizations on this important matter be clearly understood.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Allegheny Portage Railroad—Its Place on the Main Line of Public Works of Pennsylvania. An historical sketch of an early American railroad, with notable illustrations. An account of the dedication of the Portage Railroad monument on October 1, 1929 is also included. "The Pittsburgh Division of the Pennsylvania Railroad today performs much the same transportation functions—though on a far larger scale—as did the Portage Railroad and the Western Division of the Pennsylvania Canal during the period 1834-1853. * * * The Pennsylvania Railroad at present handles more traffic over the Allegheny mountains in one day than the Portage Railroad, at the height of its usefulness, carried in one year." p. 45. Issued as Pennsylvania Railroad Information, February 1930. 45 p. Pub. by Pennsylvania Railroad Publicity Bureau, Philadelphia, Penna. *Apply.*

An Autobiography of America, edited by Mark Van Doren. "The notion behind this book was that the history of America lay written already in pages which individual Americans had handed down about themselves, and that this history was best when the individuals were least 'historical' . . ." p. vii. It begins with Captain John Smith's description of Jamestown Island, and sixty-three others, men and women, reflect the changes in American scenes during the subsequent 300 years. With all respect for the problems of selection, it seems too bad that constructive railroaders have been completely omitted but perhaps the author intends to include them in another volume. 737 p. Pub. by Albert and Charles Boni, New York City, $5.

Effect of Service on Endurance Properties of Steel Rails, by John R. Freeman, Jr. and Haig N. Solakian. Research paper No. 92, Bureau of Standards. "In a previous report data were given on the endurance properties of steel from new rails. In the present report data are given on the endurance properties of steel from rails from the same heats after service and from two rails which failed due to a transverse fissure. It was found that the endurance properties of the steel were not affected by over 20,000,000 tons of traffic. . . ." p. 205. "Results of tests after service on Baltimore and Ohio Railroad" p. 215-225. "Results of tests of rail after service on Canadian Pacific Railway" p. 226-237. p. 205-246. Pub. by U. S. Govt. Print. Off., Washington, D. C. 20 cents.

The Port of Boston. Prepared by the Board of Engineers for Rivers and Harbors, War Department and Bureau of Operations, U. S. Shipping Board, as Port Series No. 2, Revised "Railroads" p. 17-18. "The freight rate situation" p. 19. Illustrations, maps, and graphs. 228 p. Pub. by U. S. Govt. Print. Off., Washington, D C. 45 cents.

Periodical Articles

Railroads Keeping Fit, by R. H. Aishton. Results of research and experiment that will make railroads effective in time of war. Military Engineer, January-February, 1930, p. 1-4.

Speed, by George W. Gray. Review of top speeds of various birds, animals, railroad trains, airplanes and rockets. Percentages of efficiency of steam locomotives, marine engines, Corliss engines, steam turbines, airplane gas engines, Diesel engines and rockets are tabulated on page 330. "A motive power which is independent of the air is the rocket . . ." p. 328. Atlantic Monthly, March, 1930, p. 322-331.

They Put Safety on a Paying Basis, by Louis Resnick. "Everybody in railroading, in casualty insurance, or in the safety profession knows that the Union Pacific has done a remarkable job in accident prevention. But only a handful of people know how this job has been done." p. 117. Nation's Business, March 1930, p. 117-120.

Looking Backward

Fifty Years Ago

The Pennsylvania lines east of Pittsburgh, Pa., handled 1,070,451 pieces of baggage during 1879, not one of which was lost, and with total payments for claims for damaged baggage of only $413.—*Railway Age,* March 18, 1880.

The Louisville & Nashville, in addition to acquiring a controlling interest in the Nashville & Chattanooga, has also acquired control of the Mobile & Montgomery, extending between Mobile, Ala., and Montgomery, 179 miles, and the New Orleans & Mobile, extending between New Orleans, La., and Mobile, 141 miles.—*Railroad Gazette,* March 12, 1880.

A company to be known as the Mexican Central [now part of the National of Mexico] was organized at Boston under the laws of Massachusetts on February 25 to construct a railroad and telegraph line from the City of Mexico in Mexico in a general northerly direction through Irapuato, Aguas Calientes, Durango and Chilhuahua to a point on the Texas frontier and a point on the Pacific coast. Five of the directors of the new company are also directors of the Atchison, Topeka & Santa Fe.—*Railway Age,* March 18, 1880.

Twenty-Five Years Ago

An unusual departure in locomotive design is represented in a Pacific type locomotive that the Chicago, Milwaukee & St. Paul has recently completed at its Milwaukee (Wis.) shops, which has a narrow firebox with dimensions of 9 ft. 5⅛ in. by 41⅛ in. The Milwaukee has experienced great difficulty in obtaining a life of more than 18 months from the side sheets of the wide fireboxes and it is for this reason that the designers have returned to the narrow firebox.—*Railway Age,* March 17, 1905.

The end of the litigation between the Hill and the Harriman interests over the division to be made of Great Northern and Northern Pacific stock in winding up the Northern Securities holding company leaves James J. Hill in undoubted control of both roads, although owning only about 25 per cent of the stock of either. The distribution will leave the ownership represented about as follows:

Great Northern—Hill, 24 per cent; Harriman, 19 per cent; Public, 57 per cent; Northern Pacific—Hill, 25 per cent; Harriman, 20 per cent; Public, 55 per cent.—*Railway Age,* March 17, 1905.

Ten Years Ago

The United States Supreme Court ruled on March 8 that the Interstate Commerce Commission, in making a valuation of a railroad, must accept present value instead of original cost. The present ruling is in a suit which was brought by the Kansas City Southern, and is of extreme importance since freight and passenger rates are to be based on such valuations.—*Railway Age,* March 12, 1920.

At least one of the practices of the government in its operation of the railroads has met with public approval—the consolidated ticket office. Among the consolidated offices that have been retained following the termination of federal control are those at Chicago; Galveston, Houston and Dallas, Tex.; New Orleans, La.; Minneapolis, Minn., and St. Paul; San Francisco, Cal., and Los Angeles.—*Railway Age,* March 12, 1920.

H. R. Safford, formerly chief engineer of the Grand Trunk and lately engineering assistant to the regional director of the Central region of the Railroad Administration, has been appointed assistant to the president of the Chicago, Burlington & Quincy. Robert V. Massey, general superintendent of the Eastern lines of the Pennsylvania, has been appointed assistant general manager of the Eastern region at Philadelphia, Pa.—*Railway Age,* March 12, 1920.

Odds and Ends of Railroading

Dispatcher-Musician

E. C. Kinney, train-dispatcher for the Pennsylvania, is the head of the Kinney family orchestra, consisting, besides himself, of his wife, two sons and a daughter. He has also been instrumental in introducing musical instruction in the schools of Sunbury, Pa., his home town, and has served as musical instructor for some years, without pay.

Most Worthy Citizen

Superintendent J. H. Walsh, of the Austin division of the Southern Pacific, has been acclaimed as the Most Worthy Citizen of Austin for 1929, and, in recognition thereof, was recently presented with a silver set and trophy, awarded annually to that citizen of Austin whose services to the Texas capital during the year shall have set him above his neighbors.

Another Entrant

James C. Murray, section laborer on the Missouri Pacific, enters the competition for large families. He and his wife, who is only 40 years old, are the proud parents of 18 children, 16 of whom are living. While the French-Canadian section foremen on the Quebec Central, recently commented upon on this page, may have larger families, Murray claims that they couldn't have healthier children.

It Runs in the Family

The Chandler family on the Tennessee division ranks high in the history of the Illinois Central. Three generations have been in the service. At no time in the last 50 years has the name of Chandler failed to appear on the division payroll, and the total service record for the father, four sons and three grandsons has reached 171 years. All four of the second generation became locomotive engineers, the three survivors, Lee, Paul and Colie, at present holding three of the four highest places on the engineers' seniority list of the Cairo district.

A Conscience-Fund Contribution

The conscience fund of the Northern Pacific was increased $1.25 last week. A letter and check from a conscience-stricken man said he felt he had caused that amount of damage to the Northern Pacific railroad when a boy. The letter follows: "Enclosed find $1.25. When I was a boy, I broke a window in a caboose accidently, and another time at a wreck I took an oil cup as a souvenir. I think $1.25 will cover, including the Old Testament standard of one-fifth added for damages 'The Lord has saved me from sin and is helping me make things right.'"

Fluid Railroading

Railroading is a play of forces in motion and, under the laws of motion or movement, we must have impact, starts and stops, speed, slips, slides, and slams. They are as necessary as the black squares of a cross-word puzzle. But we want less of it, and we should work to this end. And, unless you poke and prod and plead and praise, plot and plan and preach and pray, and push and pull, talk and think, and write and work, you will get no further than a woodpecker in a petrified forest. Last year's train sheet is in the files. This year is with us; let's "whistle off" to a new start.—From a speech by Joe Marshall, A. R. A.

The Eves of the N. C. & St. L.

Attendance to the physical ills of Nashville, Chattanooga & St. Louis employees has been the chief concern of the Eve family for the 80 years of the railroad's existence. When the Nashville & Chattanooga, predecessor of the present road, was placed in operation between Chattanooga, Tenn., and Decherd in 1850, Dr. Paul F. Eve, who was later chief surgeon of the Confederate Army during the Civil war, was appointed its chief surgeon. He served in that capacity for 28 years and was succeeded in 1878 by his son Dr. Duncan Eve. On January 1, 1930, Dr. Duncan Eve, Jr., the third in direct line of succession, maintained the family tradition through his appointment as chief surgeon to continue his father's half-century of service.

Better Late Than Never

A rather belated recognition has come to Frank L. French, agent for the Chicago, Milwaukee, St. Paul & Pacific, at Westby, Wis. He served in Porto Rico and the Philippines during the Spanish-American war, and, after 30 years, the government has recognized his bravery and valiant service with the award of a silver star and a citation for gallantry which reads as follows:

"Frank L. French, formerly Captain, Company H, 34th Infantry. For gallantry in action in the pursuit of superior forces of the enemy, under Insurgent General Tinio, in Northern Luzon, Philippine Islands, December 4, 1899, through a most dangerous and difficult country, through hardships and exposure, thereby assisting in the liberation of 22 American prisoners."

One Hundred Years Ago

Although accounts of railroad travel a century or so ago are always interesting, there are few more entertaining stories of this nature than the one which appeared in the December, 1929, issue of the monthly magazine published by the Great Western Railway of Great Britain. The account runs as follows:

"In December, 1829, the first locomotive to run on any part of the Great Western made, or attempted to make, the journey between Tredegar and Newport, a distance of 28 miles. The trip, which was in connection with a cattle show, was in the nature of an excursion, but although the passengers started at daybreak, at night they were still three miles away from their destination. After the engine had lost its funnel by coming into contact with an overhanging branch of a tree, the party decided to walk.

"This is a striking contrast to present day punctuality, safety, comfort, speed and high powered locomotives."

Inaccessible Railway Junctions

BROOKLYN, N. Y.

TO THE EDITOR:

In a recent issue you mentioned Lombard, Mont,. as being probably the only railway junction inaccessible by automobile. May I call your attention to Penn Haven Junction, Pa.? This is about ten miles west of Mauch Chunk, on the main lines of the Lehigh Valley and the Central of New Jersey. Both roads follow the deep and narrow valley of the Lehigh river—out west it would be called a canyon. At Penn Haven, the L. V., M. & H. division, comes down the even narrower and steeper valley of Black Creek and joins the main line. The boundary of the Lehigh and Wyoming divisions is also at Penn Haven, so it has the Central of New Jersey and three divisions of the L. V. serving it. Because of the narrow gorge in which the river flows, and the rough character of the surrounding hills, there is no auto road into the town, the nearest road being three miles away.

In this connection, Ashmore, Pa., is a short distance up the M. & H. division, and the divisional enginehouses and shops are situated there. The only way to reach Ashmore by auto is over the abandoned right of way of the old Delaware, Susquehanna & Schuylkill, the rails and ties of which have been removed. Its only disadvantage is that it is most decidedly a single-track road. I left Ashmore without a "clearance" one day and met another car in the middle of a high embankment. Fortunately, we saw each other in time.

JAMES WILSON.

NEWS *of the* WEEK

On the New York, New Haven & Hartford at Sharon Ho[illegible]

THE ERIE has opened a passenger car repair shop at Susquehanna, Pa. The shop, formerly used for locomotive repairs, has been reconditioned and can handle work on 50 cars at the same time.

FIRE, believed to be due to spontaneous combustion, destroyed the coach paint shops of the Cleveland, Cincinnati, Chicago & St. Louis at Beech Grove, Ind., on February 28, with an estimated loss of equipment and buildings of nearly $1,000,000. Twenty-five coaches and one business car were in the shops at the time of the fire.

ARTHUR E. MARSH, signal foreman on the Syracuse division of the New York Central has received from the company a valor medal, in recognition of his quick action, at the risk of his life, in saving a demented man who walked on the track in front of a train near Batavia, N. Y. This was on October 14, last, and the presentation was made in New York on March 10, by W. J. Fripp, assistant vice-president.

THE LEHIGH VALLEY has purchased the property on which its freight delivery tracks serving the west side of Manhattan are located. The land in question, an entire city block bounded by West Twenty-sixth and West Twenty-seventh streets and Eleventh and Thirteenth avenues, New York, with a total area of approximately 125,000 sq. ft., has been used under lease by the Lehigh Valley since 1905. It is fully developed, with a railroad yard connecting with a float bridge on the north side of Lehigh Valley Pier 66, North River, over which cars are moved to and from the Lehigh Valley's Jersey City, N. J., terminal. The railroad company is now considering the construction of warehouses over all or part of the area.

THE HOUSE COMMITTEE ON RIVERS AND HARBORS is expected to report before the adjournment of the present session of Congress an omnibus rivers and harbors bill authorizing projects estimated to cost over $100,000,000. For some weeks the committee has been giving most of its attention to these projects and the program was discussed with President Hoover at a conference at the White House on March 8, after which Chairman Dempsey of the committee made public a list of 46 projects which it is thought should be given first consideration by Congress. The list, Representative Dempsey said, represents either new or practically new projects where a large commerce has developed or old ones where there has been a large increase in traffic which requires improvements.

Correction

The derailment at Corning, N. Y., on July 11, 1929, noticed in the *Railway Age* of February 15, page 446, was due to a broken rail. The statement in the fourth line which says that it was due to a broken wheel is a misprint.

Railway Employment in January

The number of railway employees reported by Class I railways to the Interstate Commerce Commission as of the middle of the month of January was 1,561,053, a decrease of 2.11 per cent as compared with January, 1929, and a decrease of 3.09 per cent as compared with January, 1928.

Consideration of Motor Coach Bill Delayed

Debate was begun in the House on March 12 on the Parker bill for the regulation of interstate motor coach transportation by the Interstate Commerce Commission, under a rule which allowed six hours for debate. Consideration of the bill, which had been scheduled for March 4, was repeatedly delayed by adjournments of the House on account of the death of two of its members and that of Ex-President Taft.

Sir Henry W. Thornton Honored

The name of Sir Henry W. Thornton, chairman and president of the Canadian National and president of the Central Vermont, was inscribed on the Guggenheim Honor Cup at a dinner given in his honor on March 7 by the University of Pennsylvania Club of New York. The Guggenheim Honor Cup is donated by William Guggenheim, well-known New York philanthropist and graduate of the University of Pennsylvania, to the club, and on it each year is written the name of a graduate who has brought outstanding credit to the University. Sir Henry was graduated from the University in 1894.

Among those who attended the dinner were General W. W. Atterbury, president of the Pennsylvania; Patrick E. Crowley, president of the New York Central, and Daniel Willard, president of the Baltimore & Ohio.

The Pennsylvania Drives a Golden Spike

The Pennsylvania, on March 5, held ceremonies at Chicago marking the completion of the laying of 130-pound rail on its line from New York to Chicago. The program, which was held at the Chicago Terminal, near Forty-first street, included the driving of a golden spike which will complete the job of relaying the entire New York-Chicago line of 908 miles, part of which has as many as six tracks. The 130-pound standard was adopted in 1916.

The Story of the Atlantic Coast Line

"The Story of the Atlantic Coast Line," is the title of a 20-page pamphlet which has been issued by that road in commemoration of its hundredth anniversary. February 10, 1830, was the day on which the Petersburg Railroad was chartered by the General Assembly of Virginia. This was the first of the hundred and more railroads which now constitute the Atlantic Coast Line, this charter having specified a line from Petersburg, Va., southward to some convenient point on the North Carolina line. Three years later, the road was completed to a point near Weldon, N. C., 59 miles. The pamphlet gives not only an interesting sketch of the railroad's past but also tells of the expansion and improvement of the road and its facilities during the past nine years.

Fined for Helping to Celebrate

Press dispatches from Trenton, N. J., of March 3, report proceedings in the United States Court in that city under which the Pennsylvania Railroad is to pay a fine of $1400 for violation of law in the transportation of several carloads

of earth from Menlo Park, N. J., to Dearborn, Mich., for Henry Ford's recent celebration in honor of Thomas A. Edison.

The complaint held that the earth was infested with the larvae of beetles, and a representative of the United States Department of Agriculture, which department appears to have been the prosecutor, said that the railroad company should have applied suitable chemical treatment to the soil before allowing it to be carried out of the state of New Jersey. Apparently the government took measures to sterilize the dirt after it reached destination.

It will be recalled that Mr. Ford, in celebrating the fiftieth anniversary of the invention of the incandescent electric light, took down the building in which Mr. Edison worked in 1879 and transported the materials to Michigan, there re-constructing the building; and to carry out his purpose of complete transference of the laboratory to its new location, moved to Michigan also the top soil of nearly an acre of ground.

Canada's New Deputy Railways' Minister

V. Irving Smart, general superintendent of transportation of the Western region of the Canadian National, has been appointed Deputy Minister of Railways of Canada. Confirmation of Mr. Smart's appointment to the office left vacant by the resignation of R. A. C. Henry was given in Ottawa last week by Hon. T. A. Crerar, Minister of Railways. Mr. Henry has been given the post of vice-president of the Beauharnois Light, Heat & Power Company, a large Montreal concern, as announced in last week's *Railway Age*.

V. Irving Smart

Mr. Smart will also be the government director on the board of the Canadian National. Mr. Henry, while he will cease to be the government representative on that board, will continue as a director of the National System, of which he has an intimate knowledge, having been head of its bureau of economics from 1923 to 1929.

The new Deputy Minister of Railways and Canals was born at Brockville, Ont., on February 14, 1876. He was graduated from Queen's University, and from 1897 to 1898 was engaged on surveys for the Dominion government. From 1900 to 1902 he was an assistant engineer of the Illinois Central; from 1902 to 1904, assistant signal engineer. In 1904-5 he was signal engineer of the Chicago & Eastern Illinois, and from 1905 to 1907 was engineer maintenance of way of the same line. From 1907 to 1914, he was professor of railway engineering and operation at McGill University, Montreal; 1914-17, vice-president and general manager, General Railway Signaling Company; 1917-1920, consulting engineer, Montreal; 1920 to 1923, consulting engineer, Department of Railways and Canals, in connection with the Grand Trunk Railway arbitration. While at McGill University and with the General Railway Signal Company, he made investigations and recommendations for improvement in operating conditions on the Intercolonial Railway between Truro, N. S., and Moncton, N. B., and the Canadian Pacific between Montreal and Farnham, Farnham and Megantic, and Guelph Junction and London; and of the Canadian National between Fort Francis and Winnipeg.

In April, 1923, Mr. Smart entered the service of the Canadian National as special engineer, which postion he held until September, 1928, when he was transferred to the western region as general superintendent of transportation, which postition he now vacates to become Deputy Minister of Railways and Canals.

Soviet Commission to Study American Railroads

Thirty-four engineers, representing the Commissariat for Transportation of Soviet Russia, have recently arrived in this country to make an intensive three-months study of rolling stock and operating methods on American railroads.

After inspecting the Baldwin Locomotive Works and various railroad facilities in the vicinity of Philadelphia, Pa., the delegation visited Washington, D. C., and Altoona, Pa., where they examined the Pennsylvania shops. The complete itinerary also includes visits to Chicago and St. Louis, and to the Ford Motor Company's plant at Detroit, Mich., as well as a thorough examination of railroad facilities at various points in the northwestern states.

Speaking at a luncheon given to members of the delegation by General W. W. Atterbury and other officers of the Pennsylvania at the Bellevue Stratford hotel in Philadelphia on February 25, D. E. Sulimov, first vice-commissar and head of the delegation, outlined the purposes of the visit as follows:

"This is the first Soviet railway delegation to make a comprehensive study of American railway systems, the technical achievements of which have aroused the greatest interest in the Soviet Union.

"The growth of railway traffic in the Soviet Union necessitates the introduction of modern locomotives and cars. This work we hope to accomplish with the co-operation of American engineering and industry. In the past eight years the Soviet authorities have succeeded in reconstructing the Soviet railway system from its broken-down condition at the end of the world and civil wars to a level considerably in advance of the pre-war state. Last year, Soviet railways carried 62 per cent more freight than in 1913 and 13 per cent more pasengers.

"The total freight traffic in the fiscal year 1928-29, ending September 30, 1929, is estimated at 105 billion ton-kilometers (65,205,000,000 ton-miles) as compared with 88 billion in 1927-28. Passenger traffic increased 26 per cent.

Representatives of the Soviet Commissariat for Transportation

The delegation, which has just arrived from the Soviet Union to spend three months studying American railroads, includes the heads of the principal departments of the Commissariat for Transportation of the U. S. S. R. Seated, left to right, starting third from left, are: S. A. Bogdanov, chief of the traction department; V. J. Kuritzin, president of the state machine-building works; J. N. Mironov, general manager of the central administration of railway transport; D. E. Sulimov, first vice-commissar and head of the delegation; P. S. Shushkov, chief inspector of railways; M. M. Kaganovich, chief efficiency engineer, and G. D. Ulanov, president of the Donetz Railway.

"Last year the 24 per cent increase in industrial production and the still larger gain in the shipments of grain products taxed the railway system to its capacity. A reorganization of the entire system along the most modern lines is necessary. At the same time it will be necessary to construct many more railways. We trust that closer technical and business contacts of our railways with the United States will be the result of our visit."

Regional Plan Proposes New York Terminal

The erection of a railway terminal on the Hudson river waterfront of Manhattan between Fifty-ninth and Seventy-second streets, New York City, has been proposed by the Regional Plan committee of New York as one of a series of projects for the development of the city's waterfronts.

In presenting a design by Francis S. Swales, consulting architect, the Regional Plan characterizes the site—the present location of the Sixtieth street freight yards—as offering "the greatest opportunity for a really noble terminal in Manhattan." The plan visualizes a terminal "directly connecting with New Jersey, directly served by the main line of the New York Central and linked up with approaches to the Battery that are independent of the congested streets in the center of the island. "Here," the proposal continues, "there are the same opportunities of obtaining increased values as were realized about the Grand Central Station after electrification." It is admitted however, that "the building of a new station over the Sixtieth street yards might at present be out of harmony with the policy of the railroad company in the development of its freight service."

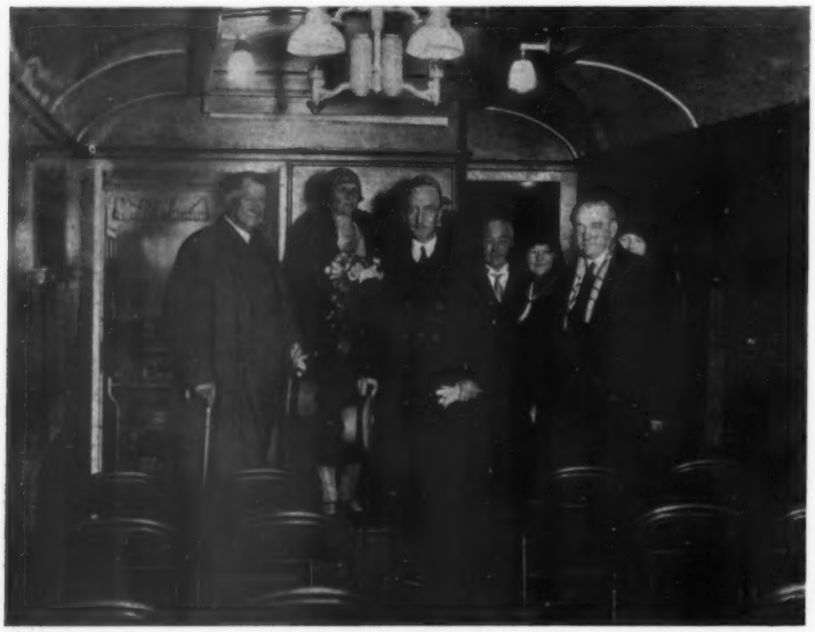
The complete plan also involves the construction of elevated roadways connecting the proposed terminal with Riverside Drive and other nearby streets, and the use of air rights over the railroad tracks for streets and apartment houses, in much the same way as Park avenue is now built up over the tracks leading into the Grand Central Terminal. The terminal proposal, part of the Regional Plan's report on Manhattan's waterfronts submitted following a study of those areas by architects and engineers, is accompanied by a similar scheme, but with no rail terminal, for the improvement of the East River waterfront.

Canadian National Equips First Aid Cars

In order to give instruction to its employees in the principles of first aid and to provide hospital facilities, when necessary, at outlying points on its system, the Canadian Natonal is equipping three cars, one of which has already been completed, with lecture rooms and medical and surgical equipment.

Intended primarily for demonstration purposes, each car contains a lecture room seating 50 students, with all necessary teaching equipment for the qualified instructor who will be in charge. For emergency treatment of sickness and injuries, there is a hospital compartment furnished with chairs; tables; a permanent bed which can be displaced by an operating table; cabinets for linen and all essential medical and surgical supplies; full toilet facilities, including a shower bath, and an inhalator, for use in cases of drowning, suffocation and shock. Adequate instructor's quarters, a complete kitchen and large water tanks are also included in the equipment, while storage batteries capable of supplying electric light for 80 hours and an oil lighting system, to be used whenever the car is stationed for more than that length of time in a region without electric light, are further provided.

The car was designed by Dr. John McCombe, chief medical officer of the Canadian National.



Inspecting the Lecture Room of a Canadian National First Aid Car

Left to right: Sir Henry Thornton, chairman and president of the C. N. R.; Lady Willingdon; Viscount Willingdon, Governor-General of Canada; Dr. John McCombe, chief medical officer, C. N. R.; Mrs. King, and Dr. James H. King, Minister of Health and Soldiers' Civil Re-establishment in the Dominion government.

Winnipeg-Hudson Bay Short Line Surveys

Canadian National engineers who have been surveying routes for a proposed direct line between Winnipeg, Man., and Churchill, on Hudson Bay, have submitted their report to the Canadian Railways and Canals Department. Four routes had been suggested as a means of providing a shorter connection from Winnipeg to tidewater than the present roundabout line via The Pas, Man., but the proposed lake and rail route via Lake Winnipeg and the all-rail route east of that lake were abandoned by the engineers because of prohibitive costs.

Of the two lines now favored by the railroad engineers and commercial interests in Manitoba, one lies between Lakes Winnipeg and Manitoba, and would make use of an existing C. N. R. line terminating at Gypsumville, Man., with new construction from that point to The Pas. The other, which would require less new construction, is the so-called Mafeking cut-off to the west of both lakes. This route would use the present Canadian National line from Winnipeg through Portage la Prairie, Neepawa, Dauphin and Swan River to Mafeking, 292.4 miles from Winnipeg, from which point a relatively short line due north would connect with the Hudson Bay Railway and the Flin Flon line near The Pas.

Rea-Newhall Memorial

To perpetuate the memories of the late Samuel Rea, former president of the Pennsylvania, and the late Daniel S. Newhall, former purchasing agent, an officer of the company has made a gift of $10,000 to the trustees of the University of Pennsylvania to found the "Rea-Newhall memorial scholarship." The scholarship is to be awarded to a son or daughter of a Pennsylvania employee, if a suitable candidate is available; otherwise at the discretion of the University authorities. It will entitle the holder to free tuition in any department for four years.

The founder of the scholarship stipulates that, to encourage the recipients to become independent and self-sustaining members of society they are to be offered the opportunity to repay the University, at their convenience, the amounts they receive; this for the purpose of making it, as far as possible, a revolving fund. A second provision is that after a suitable period, perhaps twenty years, the University shall utilize the principal as well as the income of the endowment for the promotion of the interest of the University. The founder of the scholarship believes it unwise to create perpetual trusts for welfare purposes.

The scholarship will not be awarded by competitive examinations. Applications should be made to the vice-president in

charge of personnel, [R. V. Massey] Philadelphia, giving a complete transcript of the applicants' school record.

Revenues and Expenses for January

The net railway operating income of the Class I railroads in January amounted to $55,454,416, which for that month was at the annual rate of return of 3.98 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In January, 1929, their net amounted to $77,175,935 or 5.71 per cent.

Operating revenues for the month amounted to $451,190,494, compared with $487,462,520 in January, 1929, or a reduction of 7.4 per cent. Operating expenses totaled $356,488,702, a reduction of 3.6 per cent.

Taxes amounted to $29,682,869, a reduction of $1,718,988, or 5.5 per cent, below those of the same month last year.

Thirty-seven Class I railroads operated at a loss in January, of which 12 were in the Eastern district, 3 in the Southern and 22 in the Western.

Net railway operating income by districts in January with the percentage of return based on property investment on an annual basis was as follows:

New England Region	$ 3,397,843	7.03%
Great Lakes Region	9,468,199	4.50%
Central Eastern Region	13,060,141	4.61%
Pocahontas Region	7,280,356	9.71%
Total Eastern District	33,206,539	5.38%
Total Southern District	7,581,150	3.19%
Northwestern Region	920,713	1.00%
Central Western Region	9,453,300	3.36%
Southwestern Region	4,292,714	2.63%
Total Western District	14,666,727	2.73%
UNITED STATES	$55,454,416	3.98%

EASTERN DISTRICT

The net railway operating income of the Class I railroads in the Eastern district in January was $33,206,539, at the rate of 5.38 per cent. For the same month in 1929, their net was $41,063,964, or 6.87 per cent. Operating revenues totaled $230,402,732, a decrease of 6.1 per cent, while operating expenses totaled $178,634,136, a decrease of 3.6 per cent.

Class I railroads in the Southern district in January had a net of $7,581,150, at the rate of 3.19 per cent. For the same month in 1929, the net amounted to $10,663,951, at the rate of 4.57 per cent. Operating revenues totaled $59,591,383, a decrease of 7.3 per cent, while operating expenses totaled $47,389,567, a decrease of 2.9 per cent.

Class I railroads in the Western district in January had a net of $14,666,727, at the rate of 2.73 per cent. In January, 1929, their net was $25,448,020, at the rate of 4.89 per cent. Operating revenues totaled $161,196,379, a decrease of 9.4 per cent, while operating expenses totaled $130,464,999, a decrease of 3.8 per cent.

CLASS I RAILROADS—UNITED STATES
Month of January

	1930	1929
Total operating revenues	$451,190,494	$487,462,520
Total operating expenses	356,488,702	369,737,660
Taxes	29,682,869	31,401,857
Net railway operating income	55,454,416	77,175,935
Operating ratio—per cent	79.01	75.85
Rate of return on property investment	3.98%	5.71%

Traffic

The Traffic Club of New York will hold its next meeting on Tuesday evening, March 25. The speaker will be G. C. Woodruff of the United States Freight Company, who will talk on freight containers.

The Baltimore Chamber of Commerce and the Baltimore Association of Commerce have petitioned the Interstate Commerce Commission for a re-opening of the port differential case, in which the commission decided, on December 3, 1929, that the export and import rates between differential territory and Baltimore are not unreasonable as compared with the rates to New York.

The Chicago, Milwaukee, St. Paul & Pacific has reduced the running time of "The Bat" between Chicago and the Twin Cities, the running time northbound now being 9 hr. and 50 min., or 1 hr. and 10 min. shorter than previously, and the time eastbound being 10 hr. and 35 min. instead of 11 hr. and 30 min.

Southeast Shippers Optimistic

The Southeast Shippers' Advisory Board met at Birmingham, Ala., on March 7. The reports of the commodity committees were in general optimistic. Slight increases are expected in volume of traffic during the next three months in brick, clay, etc.; in lumber and forest products and in the iron and steel industries. The movement of cotton from warehouses to mills is expected to be 30 per cent heavier than in the corresponding period of last year, and the movement of cotton seed and its products probably will increase five to ten per cent. In naval stores a decrease is expected, and in coal and coke a decrease of 10 per cent, this because of the advent of natural gas in Mississippi, Alabama and part of Georgia. Paper, etc. will probably increase six per cent. Concerning the movement of fresh fruits, no definite estimate has yet been made.

In the products not named in the foregoing paragraph, only slight changes are anticipated.

Yankee Clipper Starts March 18

The "Yankee Clipper," new fast passenger train between New York and Boston, heretofore announced by the New York, New Haven & Hartford, will be put in service on Tuesday, March 18. The train will be operated on five days in the week, Saturdays and Sundays being omitted. Each train will start at 3:30 p.m. and arrive at destination at 8:15, a faster schedule by 15 minutes than has ever before been in effect between these cities. The "launching" of these trains will be attended by ceremonies from 3 p.m. until 3:30 in New York and in Boston, and the proceedings will be broadcast from radio stations WOR, WEEI and WTC. In New York, the train will be christened by Miss Grace Harriet McKay, of Brooklyn, great granddaughter of Donald McKay, builder of clipper ships.

The extra fare on these trains will be $2.50.

* * * *

$13,000,000 in Dividend Checks

Checks for the payment of the Pennsylvania's 190th consecutive dividend ready for mailing just before their transfer from the company's general offices, Broad Street Station, Philadelphia, Pa., to the post office. This quarterly dividend, payable February 28, brings total disbursements to Pennsylvania stockholders to $943,053,446.

Foreign Railways

Japanese Railways Lower Rates

Beginning April 1, 1930, the Japanese Government Railways will reduce freight rates on certain staple articles by amounts varying from 18 to 40 per cent, according to reports issued by the Department of Commerce. Rice, wheat, potatoes and other vegetables, charcoal, fire wood, eggs, milk, salt, flour, fertilizers, newsprint and text books are among the articles affected. The reductions will mean a loss in revenue during the coming fiscal year of approximately 6,500,000 yen ($3,167,450), but it is believed that the lower rates will aid the financial rehabilitation of the country. Small merchants will benefit not only from the reduction but also from the introduction of the tonnage system, as a result of which they will be charged only for the amounts actually shipped and not for full carload lots, as was formerly the case.

Reductions in passenger fares, in some cases amounting to 33 1/3 per cent, were also put into effect on several suburban lines in the vicinity of Tokyo on January 1.

The Government Railways will spend approximately 45,000,000 yen ($21,928,500) on new construction and improvements to existing facilities during 1930. This figure had been set originally at 80,000,000 yen, but was curtailed following the decision to reduce freight rates.

Italy Dedicates One of World's Longest Tunnels

The blasting through of the thin wall of rock separating the north and south headings marked the dedication, on December 4, 1929, in the presence of railway officers, representatives of the national and local governments and dignitaries of the church, of Italy's new Apennine tunnel, one of the longest railway bores in the world.

This tunnel, 18,510 meters, or 11.3 miles, in length, is the most important engineering project involved in the construction of a new short line between Bologna and Florence. Work on it was begun in 1913, but was interrupted by the war, and recommenced in 1920. Since that time, an average of 1,300 laborers have been constantly employed in the tunnel, with 550 additional workmen engaged in outside shops. A total of 1,488,000 cubic meters of rock were excavated with the aid of 967 tons of dynamite, while 423,000 cubic meters of wall were built in lining the bore. Shifting clay soil and unusual quantities of water and gas were the chief obstacles encountered by the builders.

In length, the completed tunnel is exceeded only by the Simplon, between Italy and Switzerland, which is longer by a few hundred yards, but since that tunnel carries only one track, the new Apennine tunnel has the distinction of being the longest double-track bore in the world. It has no curves, and the steepest grade is only slightly more than one-half of one per cent. An unusual feature of the new tunnel is the construction of a station 500 ft. long midway between the portals, with two sidings accommodated by spur tunnels.

The new "direttissima" (direct line) between Bologna and Florence, of which the Apennine tunnel is a part, is under construction at a total cost of about 1,150,000,000 lire (approximately $60,300,000). The original line ran west for a short distance from Bologna, and then south through Vergato and Bagni to Pistoja, where it turned east through Prato to Florence. The new line runs directly south from Bologna to Prato, just outside of Florence, where it joins the old line. Although only 22 miles shorter, it crosses the Apennines by the tunnel at a maximum altitude of 1,046 ft., instead of the surface altitude of 2,002 ft. reached by the old line, and eliminates a large amount of curvature, so that its construction will shorten the running time between northern and southern Italy by several hours.

The accompanying photograph shows construction work on the tunnel in progress.

Progress of Construction Work on the Apennine Tunnel, Italian State Railways

More Swiss Lines to be Electrified

Following the completion, at the end of 1928, of the first electrification program of the Swiss Federal Railways, which included the conversion to electric operation of 1,666 kilometers (1,035 miles) of main line, representing 56.6 per cent of the entire mileage and carrying 85 per cent of the total traffic of the system, a second electrification plan has been adopted. This new scheme, drawn up after 1929, as a trial year, had proved the success of electric operation, covers the conversion of 476 additional kilometers (296 miles) of main line, at a total cost of 81,000,000 Swiss francs (approximately $16,200,000).

Construction is to be spread over a period of seven years, begining with 1930, so that the kilometrage of new line to be opened for electric operation in each year of the program is as follows: 1931, 76 kilometers; 1932, 122 kilometers; 1933, 44 kilometers; 1934, 133 kilometers; 1935, 58 kilometers, and 1936, 43 kilometers. Of the total cost, 44,000,000 francs will be absorbed by catenary structures, substations, etc., 34,000,000 francs by the purchase of new motive power, rolling stock, etc., and the remaining 3,000,000 francs by the strengthening of bridges.

The complete plan also involves the construction, in connection with one of the large Swiss power companies, of a new power station generating 110,000 hp.

Sir William Hoy Dies in South Africa

Colonel Sir William Wilson Hoy, chairman of the Rhodesian Railway Commission and former general manager of the South African Railways and Harbors, died in South Africa early in February, following an illness of several weeks duration.

Born in Kinross-shire, Scotland, in 1868, Sir William entered railway service with the North British (now part of the London & North Eastern), in 1880. After nine years of experience with this company, he accepted a position with the Cape Government Railways (South Africa), where he served first as clerk at Cape Town and subsequently as chief clerk to the traffic manager of the North-

ern division. In 1895 he returned to Cape Town as chief clerk to the chief traffic manager and in the following year was appointed representative of the Cape Government at Johannesburg. In 1897 he became assistant traffic manager, serving in this position with headquarters successively at Bulawayo, Kimberley and Port Elizabeth until June, 1900, when he was promoted to traffic manager at Bloemfontein, with control of the Imperial Military Railways. Two years later, on the transfer of the railways to the civil administration, he became chief traffic manager ot the Central South African system, which organization he represented at the International Railway Congress at Washington, D. C., in 1905. In January, 1909, he was appointed assistant general manager of the Central South African Railways, and on the

Sir William Hoy

formation of the Union of South Africa in the following year he became general manager of railways and harbors. During the war he acted as Director of Military Railways with the rank of colonel and for his services in this post and in the South West-African campaign was knighted. In 1918 he reassumed the duties of general manager of the South African Railways and Harbors, holding the position until his resignation in 1927. On April 1, 1928, Sir William became chairman of the Rhodesian Railway Commission, the position which he was holding at the time of his death. He was a member of the Institute of Transport and a Fellow of the Royal Geographical Society, while in 1926 he attended an Imperial Conference in London as aide to General Hertzog, then Premier of South Africa.

During Sir William's eighteen years as general manager, the South African railways increased in mileage from 7,041 to 12,300 and in capital value from £87,263,366 to £142,000,000. Passenger traffic on the system increased by 184 per cent and freight traffic by well over 100 per cent, while revenue in 1926-1927 was considerably more than double that for 1909-1910. He was active in promoting railway electrification and was largely responsible for making the South African railways a model of narrow-gage efficiency.

Equipment and Supplies

Locomotives

THE CHICAGO SHORT LINE is inquiring for one six-wheel switching locomotive.

THE MAINE CENTRAL has ordered two locomotives of the 4-6-4 type from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of February 22.

THE ALABAMA STATE DOCKS have ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 21 in. by 28 in. cylinders.

THE SPOKANE, PORTLAND & SEATTLE is inquiring for two locomotives of the 2-8-0 type and six tenders and for bids on the rebuilding of two locomotives of the 4-6-2 type.

Freight Cars

THE CHESAPEAKE & OHIO is inquiring for four air dump cars of 30 cu. yd. capacity.

THE BANGOR & AROOSTOOK is building 200 box cars in its Derby shops. The company has recently bought material for an additional 200 box cars to be built as soon as the first order is completed.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY has ordered 19 refrigerator cars from the Mt. Vernon Car Mfg. Company in addition to the 1,000 reported in the *Railway Age* of March 8.

THE UNITED STATES NAVY has ordered four tank cars with a capacity of 200,000 cu. ft., for transporting helium, from the General American Tank Car Corporation.

THE NORTH AMERICAN CAR CORPORATION has ordered 50 three-compartment tank cars of 8,000 gal. capacity from the Pressed Steel Car Company. This is in addition to 75 insulated tank cars ordered from the same builder and reported in the *Railway Age* of March 8.

THE SEABOARD AIR LINE has ordered 1,000 box cars of 50 tons' capacity from the Pullman Car & Manufacturing Corp., to be built at its Birmingham, Ala., plant and 1,000 from the Standard Steel Car Company to be built at the Richmond Car Works, Richmond, Va. Inquiry for this equipment was reported in the *Railway Age* of February 1.

Passenger Cars

THE ST. LOUIS-SAN FRANCISCO is inquiring for three dining cars.

THE CANADIAN NATIONAL has ordered two oil-electric rail motor cars and four oil-electric car frames and trucks from the National Steel Car Corporation. The four bodies are to be completed in the Canadian National shops.

THE TEXAS-MEXICAN has ordered one baggage car from the Bethlehem Steel Company.

THE DETROIT & MACKINAC has ordered one baggage car from the Bethlehem Steel Company.

Machinery & Tools

THE TEXAS & PACIFIC has ordered from Manning, Maxwell & Moore, Inc., one of the Bridgeport Safety Emery Wheel Company's heavy-duty hydraulic table-drive, face grinder, motor drive, and furnished with guide bar fixture and vertical face magnetic chuck.

Iron and Steel

THE DELAWARE, LACKAWANNA & WESTERN has placed an order for 5,000 tons of 130-lb. rail for its 1930 requirements.

THE NORFOLK & WESTERN has ordered 250 tons of steel for two bridges from the Virginia Bridge & Iron Company.

THE NORFOLK & WESTERN has ordered 600 tons of steel for an office building at Roanoke, Va., from the Virginia Bridge & Iron Company.

THE UNION PACIFIC has ordered 450 tons of structural steel for the Union Station at Omaha, Neb., from the Omaha Structural Steel Company.

THE NEW YORK CENTRAL has ordered 750 tons of steel for a bridge at New Hamburg, N. Y., from the Pheonix Bridge Company.

THE NEW YORK CENTRAL has ordered 300 tons of steel for a bridge at Athol Springs, N. Y., from the McClintic-Marshall Company.

THE TEXAS & PACIFIC has ordered 2,600 tons of structural steel for a bridge over the Trinity river at Dallas, Tex., from the McClintic-Marshall Company.

THE PENNSYLVANIA, THE CHICAGO, BURLINGTON & QUINCY, THE ILLINOIS CENTRAL AND THE CHICAGO & NORTH WESTERN have ordered 7,000 tons of structural steel for grade crossing elimination work at Sixteenth street, Chicago, from the American Bridge Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered 750 tons of structural steel for a freight building at Green Bay, Wis., 450 tons being placed with the Wisconsin Bridge & Iron Company and 300 with the McClintic-Marshall Company.

Supply Trade

H. E. Passmore has been appointed eastern railway sales manager of the **Water Development Company,** St. Louis, Mo. Mr. Passmore's office is at 207 Investment building, Pittsburgh, Pa.

P. Loyd Lewis, manager of the Kansas City branch office of the **Wagner Electric Corporation,** St. Louis, Mo., has been placed in charge of the merchandising division, with headquarters at St. Louis.

At a recent meeting of the stockholders of **Whitman & Barnes Inc.,** Detroit, Mich., **J. L. Holton** was elected secretary. Other officers of this company and its subsidiary, the **Canadian Detroit Twist Drill Company, Ltd.,** were re-elected.

J. E. McCaulley, sales engineer in the eastern district of the **Union Switch & Signal Company,** at New York, has been appointed resident manager of the Pacific Coast district with headquarters in the Matson building, San Francisco, Cal. Mr. McCaulley succeeds **S. E. Gillespie**, who has been elected vice-president of the **Westinghouse International Brake & Signal Company.**

E. R. Norris has been appointed assistant to vice-president of the **Westinghouse Electric & Manufacturing Company,** East Pittsburgh, Pa. He was formerly general works manager and will be responsible for all plant facilities of the company, manufacturing methods, cost reduction and inspection. Mr. Norris has been associated with the Westinghouse Company since 1892.

W. George Cook has been appointed special railroad representative of the **Lunkenheimer Company,** Cincinnati, Ohio. Mr. Cook's headquarters are at Chicago. He was for several years connected with The Garlock Packing Company as railroad representative and manager of its Chicago and Philadelphia branches; for the past three years he has been assistant sales manager of the New Jersey Asbestos Company in charge of industrial sales.

C. H. Jensen has joined the engineering staff of the **Copperweld Steel Company,** Glassport, Pa. After his graduation from Washington State College in 1917, Mr. Jensen was employed by the Westinghouse Electric & Manufacturing Company as a graduate student, later entering the supply engineering and transformer engineering departments. In 1924 he went with the West Penn Power Company, Pittsburgh, Pa., and since 1927 was with the Pittsburgh branch of the Byllesby Engineering & Management Corporation.

A re-organization of the **Standard Steel Car Company** and the consolidation of the new company with **Pullman Incorporated,** became effective on March 1. The officers of the new company, the **Standard Steel Car Corporation,** are as follows: **P. H. Joyce,** president; **R. L. Gordon,** vice-president; **P. G. Jenks,** vice-president; **C. P. Stembel,** vice-president; **B. P. Newton,** vice-president and comptroller; **William Bierman,** secretary and general manager; **J. A. Mountain,** assistant secretary; **C. L. Spence,** treasurer; and **C. B. McMillan,** assistant treasurer.

O. D. H. Rohwer, division sales manager of the **Universal Atlas Cement Company,** Chicago, has been promoted to assistant general sales manager. **N. A. Kelly,** previously sales manager at New York for the **Universal Portland Cement Company** has been appointed to the same position with the enlarged organization. **A. O. Stark,** representative of the **Atlas Portland Cement Company,** has been appointed assistant sales manager of the Universal Atlas Cement Company at New York. **William A. McIntyre,** of the **Atlas Company,** has been appointed to direct the sales force working out of Philadelphia, Pa., for the **Universal Atlas Company.**

L. L. King, electrical engineer of the Atchison, Topeka & Santa Fe, has resigned to become sales engineer of the **Okonite Company,** with headquarters at Chicago. Mr. King was graduated in 1909 as an electrical engineer from Kansas State College, Manhattan, Kan., and

L. L. King

immediately began work in the signal department of the Pennsylvania. Since January, 1910, he has served continuously in various capacities of increasing importance in the electrical and engineering department of the Atchison, Topeka & Santa Fe, starting as an electrician. In September, 1916, he was appointed assistant electrical engineer and in February, 1923, became electrical engineer of the Santa Fe system.

Colorado Fuel & Iron Company

The annual report for 1929 shows a net profit before deduction for equipment dismantled, of $2,350,048, as compared with $1,010,919 in 1928. The improvement, according to Arthur Roeder, president, in his message to stockholders, is due, in a large measure, to a greater volume of steel products sold and to lower manufacturing costs. The equipment dismantled totalled $409,396, while the dividends were paid on 20,000 shares of preferred stock to the amount of $160,000. The assets at the close of the year were $80,072,926. The consolidated income account as of December 31, 1929, as compared with 1928, follows:

	1929	1928
Total earnings, after deducting operating expenses (including ordinary repairs and maintenance and general taxes) and selling, administrative and general expenses	$5,837,759	$4,427,048
Interest, dividends and other miscellaneous income	541,115	436,329
Total income	$6,378,874	$4,863,377
Less interest on bonds and notes	1,628,188	1,673,097
Balance	$4,750,686	$3,190,280
Provision for depreciation of plants and exhaustion of minerals	2,130,779	2,105,907
Profit before federal income tax	$2,619,907	$1,084,373
Provision for federal income tax	269,859	73,454
Net profit for the year before deduction for equipment dismantled	$2,350,048	$1,010,919

Timken Roller Bearing Company

The annual report for the year ending December 31, 1929, shows a net profit of $14,155,414 after all expenses, as compared with $13,730,145 in 1928. Manufacturing profit totaled $19,954,383, after deducting all manufacturing costs, including materials, labor, factory expense and depreciation to the amount of $1,785,789. This compares with a manufacturing profit of $15,814,525 in 1928. Dividends paid during the year amounted to $7,223,472 as compared with $6,304,630 in 1928, while the surplus increased from $33,515,397 in 1928, to $40,457,721 in 1929.

The income account for the year ending December 31, 1929, follows:

	1929	1928
Net Profit	$14,155,414	$13,730,145
Manufacturing profit, after deducting cost of goods sold, including materials, labor, factory expense and depreciation in the amount of $1,785,789	$19,954,383	$19,187,215
Selling, administrative and general expenses	3,760,090	3,372,690
Operating profit	$16,194,293	$15,814,525
Extraordinary charges covering: obsolescence of plant property and possible shrinkage in inventories	385,463	460,791
Provision for contingencies	400,000	400,000
Less: Adjustment, re-machinery and equipment	14,571	....
Other deductions—net exclusive of interest earned and federal taxes	173,075	148,396
Profit before interest earned and federal taxes	$15,250,326	$14,805,338
Interest earned	680,088	774,807
Profit before federal taxes	$15,930,414	$15,580,145
Provision for estimated federal taxes	1,775,000	1,850,000
Net Profit	$14,155,414	$13,730,145

President M. T. Lathrop, in his statement to stockholders, said in part:

"There was expended during the year for new construction and plant improvements approximately $7,740,000. The major items were an improvement and expansion of our steel mills, tube mills and bearing factories; also additional requirements in the completion of our new plant at Gambrinus, near Canton; also extension of our plant at Canton. These, and like improve-

ments made during the past several years, were financed from earnings rather than from the sale of securities.

"Considerable progress was made during 1929 in the railway field. We have purchased from the American Locomotive Company a completely Timken-equipped class 4-8-4 steam locomotive with 63,000 pounds tractive effort. The leading, trailer, tender trucks, boosters and all driving axles are on Timken bearings. The locomotive is designed so it may be tested on most of the class I roads in the country.

"During 1929, arrangements were made with the Pennsylvania to test a Timken-equipped freight train of 100 seventy-ton coal cars. The tests are now in progress.

"Timken bearings are now being used by 133 steam roads (a year ago, 116) on either passenger cars, Pullmans, freight cars, locomotive tenders, locomotive engine trucks, gasoline electric coaches or gasoline mechanical coaches. In addition, 27 electric lines are operating cars equipped with Timken bearings.

"The more important orders obtained for railway equipment during 1929, are as follows: The New York, New Haven & Hartford is placing in service 148 Timken-equipped passenger train cars, including the Pullman equipment for two crack trains, the Merchants' Limited and Yankee Clipper. The Cleveland Railway equipped an additional 100 city cars with Timken bearings, making a total of 178 Timken-equipped cars on this line. The Pensylvania added 75 large locomotive tenders to their Timken-equipped rolling stock during the year. Some of the Timken-equipped Pullman cars on the Milwaukee road have made over 600,000 miles.

"An interesting development this year has been the application of Timken bearings to locomotives. The New York Central and the Chicago, Burlington & Quincy equipped the leading trucks of 33 and 20 of their new locomotives respectively."

American Steel Foundries

The annual report of the American Steel Foundries for 1929 shows net income for the year of $5,121,487, as compared with $3,256,072 in 1928. The surplus account, which totaled $12,900,421 as of December 31, 1929, was increased after adding the net income, to a total of $18,021,908, from which were deducted preferred stock dividends amounting to $455,000, common stock dividends amounting to $2,911,353 and the loss from the sale of property, amounting to $448,320, leaving a surplus amounting to $14,207,233. Assets totaled $59,226,644, of which current assets amounted to $18,433,236 and real estate, buildings, plants and good will $39,982,589. The condensed income statement with comparisons with 1928 follows:

	1929	1928
Earnings from operations, after deducting manufacturing, selling and administrative expenses and federal taxes	$6,494,568	$3,806,712
Deduct		
Depreciation	1,412,406	1,104,604
Net profit from operations	$5,082,162	$2,702,108
Add—Miscellaneous Income:		
Interest, discount and exchange, etc.	259,999	205,840
Income from investments	349,330	370,374
Total profit and Income	$5,691,491	$3,278,322
Deduct		
Interest charges on borrowed money	23,416	.....
Reserve for federal income tax	518,574	.....
Net earnings of subsidiary company appertaining to outstanding minority stockholdings	28,014	22,250
Net Income carried to surplus	$5,121,487	$3,256,072

George E. Scott, president, in his statement to stockholders, said in part:

We entered the year with a large tonnage of unfilled orders which assured a satisfactory rate of operation for the first half of the year. Further business received during the year was substantial and the net income resulting was satisfactory. The total net tonnage shipped by your company during the year was 600,626 tons, as compared with 459,564 tons for 1928, this increase being occasioned by larger purchases of new equipment by the railroads.

In the annual report of a year ago reference was made to the desirability of your company acquiring an interest in General Steel Castings Corporation, and during the year just ended $7,400,000 has been invested in the purchase of common stock of that corporation. Of this amount, $6,900,000 was paid in cash and $500,000 was received as consideration for the sale to that corporation of our Chester, Pa., works. The cash required for this purchase was provided by the sale to our stockholders of 90,275 shares of American Steel Foundries common stock at $40 per share, producing $3,611,000, and there was taken from working capital $3,289,000. The General Steel Castings Corporation is already making a fair return on its capital invested. It is expected the new plant at Eddystone, Pa., will commence operations some time during the early summer of this year. A satisfactory rate of return on your company's substantial investment in the General Steel Castings Corporation is anticipated.

The unfilled orders on hand at the close of the year are less than a year ago. It is anticipated, however, that railroad purchases of equipment throughout the year will be substantial, and we are looking forward to satisfactory earnings for the year.

Obituary

J. H. Weisbrod, assistant vice-president of the American Car & Foundry Company, died at his home in Brooklyn, N. Y., on March 6, after a short illness, at the age of 50 years. Mr. Weisbrod spent 30 years in the service of the American Car & Foundry Company, starting in 1901 as draftsman and estimator in the mechanical division, western department, at St. Louis, Mo. He succeeded to the office of mechanical engineer and continued in this capacity at St. Louis until January, 1918, when he was transferred to the New York office as assistant to the general manager. In December, 1923, he was promoted to assistant vice-president, which position he held until his death.

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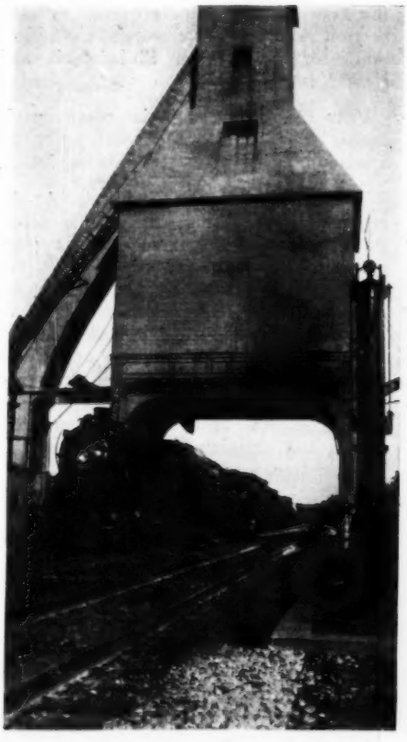

Taking Coal on the Michigan Central Near Michigan City, Ind.

Construction

ATCHISON, TOPEKA & SANTA FE.—The Santa Fe and the Chicago & Alton have approved plans for a subway under the tracks of both roads at Joliet, Ill. The project will cost about $82,000 and all of the expense will be borne by the city, although the work will be performed by the Santa Fe.

ATCHISON, TOPEKA & SANTA FE.—This company will not construct the proposed 46-mile line from Seagraves, Tex., to Lovington, N. M., authority for which was granted by the Interstate Commerce Commission. The company had asked permission to build a line south from Lovington to Henry to enable the railroad to reach the oil fields of southeastern New Mexico, but since the decision of the commission prevents the Santa Fe from reaching the oil fields, and since the line from Seagraves to Lovington would traverse an agricultural territory which has not yet developed sufficiently to justify the construction of a road to handle agricultural products only, the Santa Fe has decided not to construct the line.

CANADIAN NATIONAL.—According to Department of Commerce reports, this company is establishing a construction camp on the Richmond bank of the Fraser river, near New Westminster, B. C., preparatory to constructing a bridge across the river to Lulu Island. The bridge is the first step in the construction of one of the new lines included in the Canadian National's 1929 program of branch line extension, as reported in the *Railway Age* of February 23, 1929, page 482. The Lulu Island line, with branches, will be 29 miles long and will cost between $1,500,000 and $2,000,000.

CHICAGO & NORTH WESTERN.—The Interstate Commerce Commission has authorized this company to construct a 5.6-mile extension to its Gogebic line in Michigan; estimated cost, $164,215.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—In addition to items reported in the *Railway Age* of March 8, this company's budget for 1930 includes appropriations of $1,694,000 for the construction of a new double-track line, to be built jointly with the Chicago, Rock Island & Pacific, from Polo, Mo., to Birmingham, approximately 39 miles; $102,500 for main line relocation at Sioux City, Iowa; $700,000 for shop machinery and tools; $192,600 for improvement of grade crossings and installation of automatic warning signals, and $292,000 for signals and interlocking plants.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is asking for bids for the construction of two water stations, one at Dumas Road, Tex., and the other at Morse, on its new line from Dalhart to Morse.

CHICAGO, ROCK ISLAND & PACIFIC.—This company plans the expenditure of $250,000 at its new East Des Moines (Iowa) terminal during 1930. Work to be done this year will be part of a project for the elimination of the present terminal at Valley Junction, Iowa, west of Des Moines, and will require an ultimate expenditure of about $2,000,000 within the next three years. During 1930 four yard tracks, each 4,000 ft. long, will be constructed, four other tracks will be extended to 4,000 ft., 10 stalls will be added to the roundhouse, a wash and locker room building and a storehouse and platform will be constructed, the cinder handling plant will be provided with an additional unit, an addition will be constructed to the power plant and a sanitary sewer system will be installed. The ultimate plans provide for the construction of a 59-stall roundhouse, a machine shop, a power house, a lumber shed, a car repair shop and additional yard tracks.

CINCINNATI UNION TERMINAL.—A contract for the placing of concrete masonry for the Cincinnati, New Orleans & Texas Pacific elevated freight line into the new union terminal at Cincinnati, Ohio, has been awarded to the Kerpen Construction Company, Cincinnati, at a cost of $99,000.

DELAWARE & HUDSON.—The Public Service Commission of New York has advised this company that it does not consider as excessive the bid of Spellman & Oliver, Plattsburgh, N. Y., $62,403, for the elimination of Beardsley's crossing in Peru, N. Y.

ELGIN, JOLIET & EASTERN.—This company is asking for bids for the construction of a 300-ton coaling station at Ingalton, Ill.

GENESEE & WYOMING.—The Public Service Commission of New York has directed the reconstruction of the Pavilion-Greigsville and Greigsville-Piffard highway bridge over this company's tracks in York, N. Y., to allow for increased highway traffic. The cost of the work is estimated at $55,000.

GREAT NORTHERN.—This company is asking for bids for the construction of a 500-ton coaling station at St. Cloud, Minn.

GREAT NORTHERN-WESTERN PACIFIC.—The Interstate Commerce Commission has assigned for oral argument at Washington on April 16 and 17 the applications filed by these companies for authority to build connecting lines from Klamath Falls, Ore., to Paxton, Cal.

NEW YORK CENTRAL.—This company has asked for bids for the construction of a coaling station at Mina, Ohio.

NEW YORK CENTRAL.—In connection with this company's improvement and track elevation program at Syracuse, N. Y., reported in the *Railway Age* of November 16, 1929, the Public Service Commission of New York has directed the elimination of the Nichols avenue crossing of the West Shore and the Thompson road crossing of the New York Central.

NEW YORK CENTRAL.—Contracts have been awarded to the Phoenix Bridge Company, Phoenixville, Pa., for the manufacture, delivery and erection of the superstructure necessary for two additional tracks on bridge No. 175 at New Hamburg, N. Y., and to the General Electric Supply Corporation, New York City, for the furnishing of electrical equipment for remote control automatic substations between Riverdale and New York City in connection with the West Side electrification plan.

NEW YORK CENTRAL.—This company has been directed by the Public Service Commission of New York to award the contract for the elimination of a grade crossing in Aurelius, N. Y., to the Walsh Construction Company, Syracuse, N. Y., at a cost of $92,302. The Commission has also aproved the bid of the McClintic-Marshall Company, New York City, $24,379, for furnishing structural steel for the elimination of the grade crossing of Athol Springs road and the New York Central, New York, Chicago & St. Louis, Buffalo & Erie and Pennsylvania railroads in Hamburg, N. Y.

NEW YORK, ONTARIO & WESTERN.—The New York Public Service Commission has affirmed its order of October 11, 1928, directing the elimination of the Utica-Oneida Castle county highway crossing of this company's tracks one mile south of New Hartford, N. Y.

PENNSYLVANIA.—A contract has been let to the Belmont Iron Works, Philadelphia, Pa., at a cost of about $48,000, for transmission poles required in connection with this company's electrification program between Philadelphia and New York City.

PERE MARQUETTE.—This company is asking for bids for the construction of a water treating plant at Wyoming, Mich.

PITTSBURGH & WEST VIRGINIA.—At the request of the Pennsylvania, the Interstate Commerce Commission has postponed to March 24 the effective date of the certificate recently granted to this company authorizing the construction of the Donora extension. The Pennsylvania, which had opposed the application for the certificate, stated to the commission that it proposed to seek a court order setting aside the commission's order and enjoining the beginning of construction work.

SEABOARD AIR LINE.—This company has awarded a contract to the York Construction Company, Raleigh, N. C., for the construction of a freight depot and transfer platforms at Hamlet, N. C., at a cost of $35,000.

UNION PACIFIC.—Bids were closed on March 3 for the construction of a one-story and basement concrete and brick passenger station at Fairbury, Neb. The building will have dimensions of 38 ft. by 158 ft., and will involve an expenditure of about $90,000.

Financial

ALLEGHENY CORPORATION.—*Bonds.*—This investment trust, which is controlled by the Van Sweringen interests and which is a large holder of railway securities, is offering through J. P. Morgan & Co., the Guaranty Company, the National City Company and the First National Bank (N. Y.) $25,000,000 of its twenty-year collateral trust convertible 5 per cent bonds of 1930. Series A cumulative 5½ per cent preferred stock to a total of $12,500,000 is also to be issued. The proceeds of these issues will be used to pay indebtedness acquired by the purchase of Missouri Pacific securities. The bonds are offered at 97 to yield 5.24 per cent.

ATCHISON, TOPEKA & SANTA FE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Harper to Anthony, Kan., about 8 miles.

BALTIMORE & OHIO.—*Proposed Report Recommends Control of B. & S.*—The Interstate Commerce Commission has made public a proposed report by Assistant Director C. V. Burnside of its Bureau of Finance recommending that the B. & O. application for authority to acquire control of the Buffalo & Susquehanna by purchase of a majority of its stock be granted on condition that existing routes and channels of trade be maintained and upon the continued offer by the applicant for a period of six months to acquire the remaining outstanding stock of the B. & S. at the same price it has agreed to pay for the shares already deposited, $90 a share, which would make the total cost $6,300,000. The B. & S. was assigned to the B. & O. system in the consolidation plan. Since complete consolidation will necessitate further proceedings, the report says, the applicant should be required to preserve the continuity of records and statistics of the B. & S. for comparative purposes.

BALTIMORE & OHIO.—*Securities.*—The Interstate Commerce Commission has authorized this company to issue $63,031,000 of its 4½ per cent convertible gold bonds and $52,525,800 of common capital stock, or such portion of the latter as may be necessary to effect the conversion into common capital stock of the aforementioned bonds which may be presented for that purpose. The bonds will mature in 1960 and are redeemable at a premium of 5 per cent plus one per cent for each six months between the redemption date and date of maturity. They will be convertible into common stock after February 1, 1931, at $120 a share; after February 1, 1936, at $125 a share; and after February 1, 1941, and prior to 1946, at $130 a share. Provision is made for the adjustment of the conversion price of the stock in the event of the issue of additional common stock at less than the conversion price then in effect, except that no adjustment is to be

made in the case of common stock issued to officers and employees at not less than par to an amount not exceeding $15,000,000. The common stock issue is solely for the purpose of conversion and the issue will be limited to that purpose. The bonds were offered to the railroad's common and preferred stockholders at 95 and accrued interest. The issue was underwritten by Kuhn Loeb & Co. and Speyer & Co., with which the National City Company was associated, these bankers agreeing to purchase at 95 any bonds not taken by the stockholders, the underwriter's fee being 2½ per cent on the entire issue, making the annual cost to the railroad 4.984 per cent. The proceeds of the issue will be used largely for expenses in connection with the acquisition of control of the Buffalo, Rochester & Pittsburgh and the Buffalo & Susquehanna and for additions and betterments.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its line from Worthington, Iowa, to Farley, 6.8 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has denied the application of this company to abandon its Norway branch extending from Babcock to Norway, Wis., 18.8 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust.*—The International Manhattan Company and Salomon Bros. & Hutzler are offering, subject to the approval of the Interstate Commerce Commission, $4,260,000 of this company's 4½ per cent equipment trust certificates, series L, dated March 1, 1930, and maturing in installments from 1931 to 1945. The issue is priced to yield from 4.5 per cent to 4.85 per cent, depending upon the date of maturity.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA. — *Abandonment.* — Examiner Weed of the Interstate Commerce Commission, in a proposed report, has recommended that the commission authorize the abandonment of the line from Emerald to Woodville, Wis., 9.59 miles.

DELAWARE & NORTHERN.—*Stock.*—The Interstate Commerce Commission has authorized this company to issue 1,100 shares of no-par common stock, to be sold or otherwise disposed of at not less than $100 a share.

DETROIT, TOLEDO & IRONTON.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Durban to Dundee, Mich., 4.8 miles.

GRAND TRUNK WESTERN.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue 80,482 shares of no-par common stock and $2,651,500 of preferred stock to repay advances by the Canadian National, and also 166.877 shares of common stock to finance capital expenditures in 1929.

HOCKING VALLEY.—*Final Valuation.*—The Interstate Commerce Commission, in its final valuation report as of 1917, finds the final value for rate-making purposes of the property owned and used for common-carrier purposes to be $33,460,000 and that of the property used but not owned to be $1,028,123. The book investment in road and equipment, including land, was $44,532,216.

LOUISIANA RAILWAY & NAVIGATION COMPANY.—*Abandonment.*—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has recommended in a proposed report that the commission authorize the abandonment by this company of operation of a line of the Louisiana & Arkansas from Winnfield to Aloha, La., 25.38 miles.

MAINE CENTRAL.—*Annual Report.*—The annual report of this company for 1929 shows net income after interest and other charges of $1,746,257, as compared with net income of $788,431 in 1928. Selected items from the income statement follow:

MAINE CENTRAL

	1929	1928	Increase or Decrease
Average Mileage operated.	1,122	1,122	.....
RAILWAY OPERATING REVENUES	20,312,269	19,301,899	+1,010,370
Maintenance of way	2,848,567	2,911,110	— 62,543
Maintenance of equipment	3,951,150	3,712,820	+ 238,330
Transportation	7,410,227	7,520,462	— 110,235
TOTAL OPERATING EXPENSES	15,067,261	14,986,283	+ 80,978
Operating ratio	74.18	77.64	— 3.46
NET REVENUE FROM OPERATIONS	5,245,008	4,315,616	+ 929,392
Railway tax accruals ...	1,127.688	1,335.985	— 208,297
Railway operating income...	4,116,659	2,977,331	+1,139,328
Hire of freight cars—Dr. .	79,409	28,314	+ 51,095
Joint facility rents—Dr.	399.618	312,421	+ 87,197
NET RAILWAY OPERATING INCOME	3,680,319	2,704,327	+ 975,992
Non-operating income ...	248,935	258,990	— 10,055
GROSS INCOME.	3,929,255	2,963,317	+ 965,938
Rent for leased roads	803,526	822.893	— 19,367
TOTAL DEDUCTIONS FROM GROSS INCOME	2,182,998	2,174,886	+ 8,112
NET INCOME..	1,746,257	788,431	+ 957,826

MERIDIAN & BIGBEE.—*Operation.*—Examiner Sullivan, of the Interstate Commerce Commission, in a proposed report, recommends that the commission deny this company's application for authority to operate a line from Crandall to Cliff Williams, Miss., 25 miles.

NEW ORLEANS GREAT NORTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that portion of its Shore Line branch extending from Covington Junction, La., to Folsom, 12 miles.

NEW YORK CENTRAL.—*Stock.*—The Interstate Commerce Commission has authorized this company to issue $7,500,000 of capital stock to be offered at $130 a share to officers and employees who have been for two years or longer in the service of the company.

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $4,545,000 of its 4½ per cent equipment trust certificates dated March 15 and maturing in installments from 1931 to 1945. The issue is authorized for sale to the highest bidder, i.e., a syndicate comprised of the First National Bank of New York, and Salomon Bros. & Hutzler, at 97.72, making the average annual cost to the railroad approximately 4.875 per cent.

ORANGE & NORTH WESTERN-TEXAS & NEW ORLEANS.—*Operation.*—These roads have been authorized by the Interstate Commerce Commission to operate, under the name of the Orange Terminal Association, the municipal port railroad facilities at Orange, Tex.

PENNSYLVANIA.—*Bonds.*—Kuhn, Loeb & Co. are offering, subject to the approval of the Interstate Commerce Commission, $60,000,000 of 4½ per cent forty-year gold debenture bonds of this company, due in 1970. The issue is redeemable after 1940 at 102½ plus ¼ per cent for each six months between redemption date and maturity. The bankers are offering the issue at 94½, which will make the yield 4.81 per cent.

RUTLAND.—*Dividend.*—A dividend of 2 per cent on preferred stock has been declared by this company. A similar dividend was paid in October, 1929, the last previous payment having been a 1 per cent dividend in December, 1928. The present dividend is payable April 15 to stockholders of record March 28.

SEABOARD AIR LINE—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon 4 miles of its line between Mile Post 467 and Coosaw Wharf, S. C.

SEABOARD AIR LINE.—*Preliminary report.*—The preliminary statement of this company for the year 1929 shows net income after interest and other charges of $1,011,663, as compared with net income in 1928 of $1,180,283. Selected items from the income statement follow:

	1929	1928	Increase or Decrease
Average Mileage operated	4,490.38	4,498.61	— 8.23
RAILWAY OPERATING REVENUES	58,151,908	57,245,207	+ 906,701
Maintenance of way	7,272,642	6,877,967	+ 394,676
Maintenance of equipment	10,224,458	9,554,021	+ 670,437
Transportation	20,161,358	21,193,862	—1,032,503
TOTAL OPERATING EXPENSES	42,587,557	42,902,964	— 315,407
NET REVENUE FROM OPERATIONS	15,564,351	14,342,243	+1,222,108
Railway tax accruals	3,715,004	3,536,270	+ 178,733
Railway operating income	11,830,410	10,785,088	+1,045,322
Equipment rents—Dr. ..	751,271	644,900	+ 106,371
Joint facility rents—Dr. ..	113,414	84,771	+ 28,643
NET RAILWAY OPERATING INCOME	10,965,725	10,055,417	+ 910,308

Non-operating income	1,211,457	2,408,434	—1,196,977
GROSS INCOME	12,177,182	12,463,851	— 286,669
Rent for leased roads	2,206,852	2,273,239	— 66,387
Interest on funded debt	7,351,491	7,299,444	+ 52,047
TOTAL DEDUCTIONS FROM GROSS INCOME	11,165,518	11,283,567	— 118,049
*NET INCOME	1,011,663	1,180,283	— 168,620

*(Exclusive of Interest on Adjustment Mortgage (Income) Bonds.)

ST. LOUIS & O'FALLON.—*Valuation Hearing.*—The Interstate Commerce Commission has re-opened the recapture valuation proceeding for the purpose of receiving additional evidence relating to the period 1920 to 1923, which was involved in the order set aside by the Supreme Court, and also for the purpose of the new hearing as to the period ending December 31, 1927, before Examiner Folsom at Washington on May 5.

ST. LOUIS-SAN FRANCISCO.—*Consolidation.*—This company and the Chicago, Rock Island & Pacific are said to be considering a merger plan that will conform as far as possible to the plan of the Interstate Commerce Commission. Directors of the Frisco will meet in New York on April 2 to consider the merger.

Dividends Declared

Lehigh Valley.—Common, $.87½, quarterly; Preferred, $1.25, quarterly; both payable April 1 to holders of record March 15.

Missouri Pacific.—Preferred, $1.25, quarterly, payable April 1 to holders of record March 14.

Old Colony.—1¾ per cent, quarterly, payable April 1 to holders of record March 15.

Rutland.—Preferred, $2.00, payable April 15 to holders of record March 28.

Texas & Pacific.—Common, $1.25, quarterly, payable March 31 to holders of record March 15.

Average Prices of Stocks and of Bonds

	Mar. 11	Last week	Last year
Average price of 20 representative railway stocks	133.84	133.96	132.33
Average price of 20 representative railway bonds	93.27	92.64	90.76

* * *

New and Old Signals on the First Electrified Section of the Reading

Railway Officers

Executive

G. W. Mertens, superintendent and general freight and passenger agent of the Pacific Coast Railroad, has been appointed assistant vice-president, with headquarters as before at Seattle, Wash.

Financial, Legal and Accounting

J. Grover Joyce has been appointed commerce counsel and general attorney of the Missouri & North Arkansas, with headquarters at Kansas City, Mo.

The headquarters of **J. L. Scott,** general claim agent of the Illinois Central, have been removed from Chicago to Memphis, Tenn.

E. E. Godwin has been appointed general counsel of the Ashley, Drew & Northern, with headquarters at Camden, Ark.

G. F. Dodge has been appointed tax commissioner and special representative of the Denver & Rio Grande Western, with headquarers at Denver, Colo.

J. B. Rosenberger has been appointed auditor of freight accounts of the Minneapolis, Northfield & Southern and the Minnesota Western, with headquarters at Minneapolis, Minn.

J. J. Cogan, general manager of the Midland Terminal, with headquarters at Colorado Springs, Colo., has also been appointed auditor. **M. W. Bogart** has been appointed secretary with headquarters at Colorado Springs.

Operating

L. A. Gregory has been appointed acting superintendent of the De Quincy division of the Gulf Coast Lines, with headquarters at De Quincy, La.

W. J. Galbroner, assistant superintendent of the Ohio division of the New York Central, has been promoted to superintendent of that division, with headquarters as before at Columbus, Ohio.

H. S. Nelson, trainmaster on the Strong City, Minneapolis and Salina districts of the Atchison, Topeka & Santa Fe, with headquarters at Abilene, Kan., has been transferred to the First, McPherson and Little River districts with headquarters at Newton, Kan., and is succeeded by **W. S. Dickensheet** as acting trainmaster. **N. H. Buck,** general yard master, with headquarters at Newton, Kan., has been appointed acting trainmaster on the Second, Third and Eldorado districts with headquarters at Newton, succeeding **A. B. Class,** deceased.

Traffic

J. R. Holland has been appointed general agent for the St. Louis-San Francisco at Blytheville, Ark.

W. G. Evans has been appointed general freight department agent of the New York Central at Detroit, Mich.

J. A. Kell has been appointed freight traffic manager of the Missouri & North Arkansas, with headquarters at St. Louis, Mo.

H. A. Fischer has been appointed general agent, freight department, for the Duluth, South Shore & Atlantic at Detroit, Mich.

A. T. Stovall, Jr., has been appointed general agent, freight and passenger departments, of the Southern, with headquarters at Havana, Cuba.

R. M. Scott has been appointed general agent in charge of traffic and transportation matters on the Louisiana & Arkansas, with headquarters at Baton Rouge, La.

C. C. Woodworth, district freight agent of the Southern at Cincinnati, Ohio, has been promoted to assistant freight traffic manager, with headquarters at the same point.

I. S. Auch, general freight traffic agent on the Lehigh Valley, with headquarters at Buffalo, N. Y., has been appointed general freight agent; **J. F. James, Jr.,** has been named general eastern freight agent; and **W. H. Lancton,** city freight agent, all with headquarters at New York. **J. F. Sullivan** has been appointed assistant general freight agent of the Lehigh Valley Terminal at Buffalo, N. Y., and **F. X. Keilt,** division freight agent, with headquarters at Newark, N. J.

Roscoe James Doss, general traffic agent of the Atlantic Coast Line at Wilmington, N. C., has been appointed assistant freight traffic manager, with the same headquarters. Mr. Doss was born on March 30, 1884, at Canton, Ga., and was educated at Etowah Institute. He commenced his railway career on September 1, 1900, with the Atlantic, Knoxville & Northern (now part of the Louisville & Nashville) and continued there until January, 1904, serving as telegraph operator and local agent. During 1904-5, he was overcharge claim investigator in the office of the freight claim agent on the Southern, at Washington, D. C. From 1906, until 1913, he was connected with the Louisville & Nashville, holding various positions in its traffic department. From 1913 to the present time, he has served in the traffic department of the Atlantic Coast Line, and has held the positions of chief rate clerk and chief clerk in the general freight office at Savannah, Ga., assistant to general

freight agent, assistant general freight agent, general freight agent, and now assistant freight traffic manager, with headquarters at Wilmington, N. C. During the period of federal control he was a member of the Southern freight committee, United States Railroad Administration.

Albert C. McIntyre, general freight agent of the Lehigh Valley, at New York, has been appointed assistant freight traffic manager, with the same headquarters. Mr. McIntyre was born on December 31, 1888, at Hyde Park, Boston, Mass., and attended the local grammar and high schools. He entered railway service in 1903 as a clerk in a local station of the New York, New Haven & Hartford at Boston. He was later transferred to the general freight office and remained there as rate clerk until 1910 when he went with the Lehigh Valley as a clerk in the office of its New England freight agent at Boston. In 1915 he was appointed soliciting freight agent at Boston and shortly thereafter was transferred to Chicago in the same capacity. In 1917 he went to Toledo, O., as commercial agent and remained there until the office was closed under federal control when he was transferred to the office of the assistant general freight agent at Buffalo, N. Y. Later on in 1918 he went to New York as chief clerk to the general freight agent. On January 1, 1920, he was appointed city freight agent at New York and on July 15 of the same year became assistant to the traffic manager. In 1921 he was appointed assistant general freight agent, and in December, 1925, general freight agent, which position he held until his recent appointment.

R. J. Foreman, general foreign freight agent of the Canadian National, has been appointed traffic manager of the foreign freight department, with head-

R. J. Foreman

quarters as before at Montreal, Que. Mr. Foreman commenced his railway career in 1892 with the Lake Erie & Detroit River Railway (now the Pere Marquette) at Walkerville, Ont., and served successively as clerk, stenographer, and chief clerk to the general freight and passenger agent. In March, 1902, he was appointed chief clerk to the superintendent of the Buffalo division of the Pree Marquette, at Walkerville and St. Thomas, Ont., and Detroit, Mich. In September, 1904, he became chief clerk to the chairman of the Canadian Freight Association, first at Toronto, Ont., and then at Montreal, Que. From January, 1908, until August, 1913, he served successively as chief clerk to the assistant freight traffic manager, chief of tariff bureau, and assistant general freight agent of the Grand Trunk Pacific (now part of the Canadian National), with headquarters at Winnipeg, Man. In August, 1913, he became assistant to the vice-president of the Grand Trunk and of the Grand Trunk Pacific, at Montreal. In July, 1920, he was appointed foreign freight agent of the Canadian National at Montreal, and in November, 1926, general foreign freight agent, which position he held at the time of his recent appointment.

Engineering, Maintenance of Way and Signaling

Edward W. Backes, assistant division engineer of the Boston & Maine, with headquarters at Brattleboro, Vt., has been appointed division engineer of the Connecticut River division, with headquarters at Springfield, Mass., succeeding **Henry C. Archibald,** who has been transferred to a similar position on the Portland division, with headquarters at Dover, N. H. Mr. Archibald succeeds **John F. Collins,** who has succeeded **Samuel P. Coffin,** resigned, as division engineer of the Fitchburg division, with headquarters at Greenfield, Mass. **L. E. Norton,** assistant signal supervisor, with headquarters at Dover, N. H., has been appointed signal supervisor, succeeding **Edward F. Gates,** deceased.

John G. Sheldrick, who has been promoted to engineer maintenance of way of the Minneapolis, St. Paul & Sault Ste. Marie, with headquraters at Minneapolis, Minn., has been connected with the engineering department of that road for nearly 24 years. He was born at Minneapolis on May 3, 1880, and entered railway service in May, 1898, as a chainman on the Chicago, St. Paul, Minneapolis & Omaha. Later he was advanced to rodman, and to masonry inspector, then entering the service of the Soo line in May, 1903, as a rodman. In the following year he became a bridge inspector and during the construction season of 1905 he was promoted to resident engineer in charge of the construction of two 12-mile sections of line. Mr. Sheldrick was appointed assistant engineer on general engineering department maintenance work in 1906, later being appointed resident engineer at Superior, Wis., where he remained until August, 1917, when he became manager of two eastern Ohio bituminous coal mines. He re-entered railway service on March 1, 1920, as resident engineer on the Soo line at Minneapolis, his promotion to engineer maintenance of way becoming effective on February 1.

S. B. Wass, terminal engineer of the Canadian National during the construc-

S. B. Wass

tion of the Toronto viaduct, has been given jurisdiction over that portion of the Montreal terminal outside of the central station area, as assistant to **C. B. Brown,** chief engineer in general charge of the project. Since Mr. Wass was graduated from Toronto University in 1903, he has been engaged in railroad engineering almost continuously, principally on railway construction and betterments, including the design and erection of buildings, bridges and other structures. He entered the service of the Canadian Government Railways (now part of the Canadian National System) in 1914. Since 1920, Mr. Wass' duties have been in connection with terminal construction and re-arrangements. As engineer he was in charge of the construction of the terminal facilities at Moncton during 1920-21 and the construction of the new and improved terminal and gravity yards at Noebing, near Fort William, Ont., which have been a very important factor in the rapid and efficient handling of the grain movement, which formerly deluged the ports of Fort William and Port Arthur, Ont. From 1924 to 1929, he was terminal engineer for the construction of the Toronto viaduct which included a large grading operation, and on work there for the exclusive use of the Canadian National, which included locomotive and car terminal facilities.

Mechanical

G. E. Dailey has been appointed acting master mechanic of the Toledo, Peoria & Western, with headquarters at Peoria, Ill.

Louis A. North, superintendent of the Burnside shops of the Illinois Central at Chicago, has retired from active duty after 28 years of service.

J. W. Keppel, master mechanic on the Canadian Pacific, with headquarters at

Edmonton, Alta., has been transferred to a similar position on the Brandon division, replacing D. D. Cossar, transferred.

J. W. Anderson, assistant superintendent of motive power and machinery of the Chicago & North Western at Chicago, has been appointed master mechanic at Winona, to replace **O. Protz.**

The jurisdiction of **A. R. Sykes,** master mechanic of the Southern Kansas division of the Missouri Pacific, with headquarters at Coffeyville, Kan., has been extended to include the Central division.

J. A. Nash, superintendent of motive power of the Illinois Central, with headquarters at Chicago, has resigned and the position has been abolished. **L. Robinson,** shop engineer at Chicago, has been promoted to assistant to the superintendent of motive power, with headquarters at Chicago.

Effective March 6, the following officers of the Central of New Jersey will occupy similar positions with the Wharton & Northern and Mount Hope Mineral: **G. W. Rink,** mechanical engineer of the Elizabethport shops, with headquarters at Elizabeth N. J.; **F. H. Becherer,** assistant superintendent motive power and equipment; **J. S. Hagan,** electrical engineer; **John Clark,** superintendent car department; **W. M. Perrine,** master mechanic; **R. H. Nicholas,** general locomotive inspector; **J. J. Mansfield,** chief boiler inspector; **H. L. Sandhas,** general inspector, and **T. D. Bevan,** engineer of power houses, all with headquarters at Jersey City, N. J.

A. W. Byron, master mechanic of the Philadelphia Terminal division, will succeed Mr. Swope as superintendent of motive power, Central Pennsylvania division. Mr. Byron was born on January 3, 1880, at Buffalo, N. Y. He entered the service of the Pennsylvania as a draftsman in the Buffalo shops on December 3, 1899. On January 1, 1906, he was advanced to the position of assistant master mechanic at Olean, N. Y., and on November 21, 1912, he was appointed master mechanic in the South Pittsburgh shops. Mr. Byron was promoted to the position of master mechanic of the Philadelphia Terminal division on February 1, 1928.

B. M. Swope, now superintendent of motive power of the Central Pennsylvania division, will succeed H. W. Jones, promoted, as superintendent of motive power, Western Pennsylvania division. Mr. Swope was born on June 13, 1884, at Altoona, Pa. He was graduated from Lehigh University in 1907. On July 1, 1908, he entered the service of the Pennsylvania as a special apprentice at Altoona. After experience in maintenance of equipment work, he was made assistant master mechanic of the Renovo division in March, 1917, and in May, 1923, he was appointed assistant engineer of motive power at St. Louis, Mo. On April 1, 1928, Mr. Swope was advanced to the position of superintendent of motive power of the Central Pennsylvania division, with headquarters at Williamsport, Pa.

Purchases and Stores

The jurisdiction of **G. D. Tombs,** division storekeeper on the Illinois Central at Memphis, Tenn., has been extended to include all material heretofore handled by the Grenada (Miss.) storehouse, succeeding **W. A. Prather,** who has been assigned to other duties.

W. A. Summerhays has been appointed manager, forest products inspection and research bureau of the Illinois Central, with headquarters at Memphis, Tenn., and the position which he formerly held—lumber and tie agent at Chicago—has been abolished. The purchase of lumber and ties was placed under the supervision of **J. J. Bennett,** purchasing agent, on March 1. The headquarters of **C. S. Burt,** superintendent of ties and treatment, have been transferred from Memphis to Grenada, Miss.

Special

S. P. Hollingsworth has been appointed publicity and advertising agent of the Denver & Rio Grande Western, with headquarters at Denver, Colo.

B. A. Heath has been appointed agricultural development agent of the Duluth, South Shore & Atlantic, with headquarters at Marquette, Mich.

J. S. McGowan, western manager of colonization and agriculture of the Canadian National, with headquarters at Winnipeg, Man., has been promoted to assistant director of that work, with headquarters at Montreal, Que. **Robert England,** continental superintendent of colonization, has been appointed western manager of colonization and agriculture succeeding Mr. McGowan. **E. H. Gurton,** eastern manager of colonization at Montreal, Que., has been appointed superintendent of colonization and land settlement at St. Paul, Minn., succeeding **L. B. Boyd,** resigned.

Obituary

W. S. Hobbs, who retired as general manager of the Warren & Ouachita Valley in March, 1929, died on March 8 at Warren, Ark.

C. M. Hitch, district master car builder of the Baltimore & Ohio, with headquarters at Cincinnati, Ohio, died on March 4, from heart trouble.

Samuel G. Warner, who retired as general passenger and ticket agent of the Kansas City Southern in March, 1928, died at his home at Kansas City, Mo., on February 12. Mr. Warner, who had served as general passenger and ticket agent of the Kansas City Southern for 28 years, was a native of Connecticut. He entered railway service in 1888 as city freight and passenger agent of the St. Louis, Arkansas & Texas (now the St. Louis Southwestern) at Memphis Tenn. He advanced through various positions in the traffic department of the Cotton Belt, including that of general passenger and ticket agent, with headquarters at Tyler, Tex. In 1900 Mr. Warner was appointed general passenger and ticket agent, a position he retained at Kansas City until his retirement in 1928.

Alexander Steele Lyman, for twenty-two years general attorney of the New York Central, and since 1925 valuation counsel of the New York Central Lines, died from heart disease on March 7, after a five months' illness, at his home at Shore Acres, Mamaroneck, N. Y. Mr. Lyman was born in New Orleans, La., on April 8, 1860. He was graduated from Chamberlain Institute, at Randolph, N. Y., in 1880, received his A. B. degree from New York University four years later and his L. L. B., *cum laude,* from Columbia in 1886. His first years of law work were in the office of the late Judge Horatio Russell. Before Mr. Lyman became a member of the New York Central's law department, he represented the railroad in the Park Avenue viaduct damage cases in 1897 when he was a member of the firm of Blair, Phelps & Lyman. The following year he acted as counsel to the receiver of the Brooklyn Elevated Lines, and in

Alexander Steele Lyman

April, 1899, when the Brooklyn Rapid Transit Company acquired the properties of the former company, he was placed in charge of the claim department. In 1901 he resigned to rejoin the law firm of which he had previously been a member, for three years preceding his becoming assistant to the general attorney of the New York Central. On January 1, 1908, he was appointed general attorney, a position he retained even after his appointment as valuation counsel of the New York Central Lines on January 1, 1925. Mr. Lyman founded the New York Central Veterans Association, which now numbers some 15,000 members. He was a director of the Merchants Despatch Transportation Company, and also of the Merchants Despatch, Inc. For many years he has served on the Council of New York University, and also was chairman of the board of managers of the Railroad Branch of the Y. M. C. A.